

**Minutes
of the
30th Meeting of the Academic Council
held on
Tue 3rd Oct 2017
by VLC**



Bahria University Islamabad

Reference Designators & Terms used in this Document

These designators/terms are meant to introduce clarity, standardisation and ease of reference while consulting or referring to this document.

Item Number	o_on_n , where o _o = ordinal sequence of the Academic Council Meeting. n _n = serial number of Item in that meeting.
	Example: Item 2213 means item No 13 taken up by the 22 nd ACM
Decision on New Item	O_on_n
	Example: Decision 2213 means Decision on Item 2213. Example: Decision 2213.b means Decision 2213, clause 'b'. Example: Decision 2213.b.3 means Decision 2213, clause 'b', sub-clause '3'
Decision on Previous Item	O_oO_o(o_on_n)
	Example: Decision 22(1930) means Decision taken by the 22 nd ACM on the previous/review Item 1930. Example: Decision 22(1930).b means Decision 22(1930), clause 'b'. Example: Decision 22(1930).b.3 means Decision 22(1930), clause 'b', sub-clause '3'.
Action	Authority, Entity, Official, Person, Unit, Dept, Office, etc required to implement the decision
Responsibility	The supra single Authority, Entity, Official, Person, etc required to: <ol style="list-style-type: none"> Coordinate the actions taken by the Authorities, Entities, Officials, Persons, Units, Depts, Offices, etc listed against "Action". Report to the Council the progress on the matter, through periodic progress reports and at the meeting of the Council. Be overall responsible to the Competent Authority, and the Council, for the case/issue/point/item he or she has been made responsible for.
Statutory Documents affected	Most decisions of the Academic Council imply amendments to the relevant statutory documents. These amendments shall be processed and incorporated into the said documents forthwith and certainly before the next meeting of the Academic Council. The responsibility of processing the amendments and incorporating them into the statutory documents shall be as per the Registrar Notification 23/2015 dated 25 th May 2015.
Deadlines	Any time period deadlines shall count from the date of issue of the minutes. Time period in days shall imply working days.

(inside cover)

Contents

Acronyms & Abbreviations used in this Document	v
Attendance	1
Proceedings	3
Preliminaries.....	3
Confirmation of the Minutes of the 29th ACM held on 17th May 2017.....	3
Review Items	3
<i>Item 2009: Commencement of Indigenous PG Programmes (MPhil & PhD) in Basic Health Sciences at BUMDC.....</i>	<i>3</i>
<i>Item 2234: Bahria University Lahore Campus – Progress Report.....</i>	<i>5</i>
<i>Item 2331: Audit Documentation and Reporting in the Faculty of Management Sciences, Status of</i>	<i>7</i>
<i>Item 2334: BBA & MBA programmes – Heuristic & Flipped Classroom Methods of Teaching & Evaluation8</i>	
<i>Item 2432: MS Supply Chain Management at BUKC – Progress</i>	<i>9</i>
<i>Item 2619: MS in HRM & Organizational Psychology at BUKC – Progress.....</i>	<i>9</i>
<i>Item 2620: MS in Risk Management at BUKC - Progress</i>	<i>9</i>
<i>Item 2449: BUMDC Dental Section – Progress Report</i>	<i>10</i>
<i>Item 2511: MSMS Program – Progress (ex- MPhil Programmes - Change of MPhil Nomenclature to MS)11</i>	
<i>Item 2519: PhD in Management Sciences at BULC - Progress.....</i>	<i>11</i>
<i>Item 2613: MS(Information Security) at BUIC – Progress</i>	<i>12</i>
<i>Item 2615: MS Mathematics at BUIC – Progress</i>	<i>12</i>
<i>Item 2616: MS Mathematics (ex-MS Applied Mathematics) at BUKC - Progress.....</i>	<i>13</i>
<i>Item 2621: MS EE (Weekend) at BUKC – Progress</i>	<i>13</i>
<i>Item 2643: Grooming Students, Framework for.....</i>	<i>14</i>
<i>Item 2707: BS Economics Programme at BUIC – Progress</i>	<i>15</i>
<i>Item 2709: MS Islamic Banking & Finance at BUIC – Progress.....</i>	<i>15</i>
<i>Item 2710: MS Marketing & Sales at BUIC – Progress</i>	<i>16</i>
<i>Item 2712: PhD Software Engineering at BUKC – Progress.....</i>	<i>17</i>
<i>Item 2713: PhD Program in Environmental Sciences at BUIC – Progress.....</i>	<i>17</i>
<i>Item 2722: Doctor of Physical Therapy Programme – Progress Report</i>	<i>18</i>
<i>Item 2817: MBA Pharmaceutics and Health Management – Progress (ex-MBA Pharmaceutical and MBA Health Management).....</i>	<i>19</i>
<i>Item 2818: MBA Banking at BUKC - Progress.....</i>	<i>20</i>
<i>Item 2820: PhD Mathematics at BUIC – Progress</i>	<i>20</i>
<i>Item 2821: PhD in Law at BUIC – Progress</i>	<i>21</i>
<i>Item 2832: Collaboration with ABE, UK, for Joint Programs</i>	<i>22</i>
<i>Item 2834: PhD Media Studies at BUIC – Progress.....</i>	<i>22</i>
<i>Item 2838: MS Media Studies at BUKC – Progress</i>	<i>23</i>

<i>Item 2901:</i>	<i>HEC's New Academic Rules (HECAR), Review of</i>	24
New Items		25
<i>Item 3001:</i>	<i>MS IR - Inclusion of Elective 'International Politics of Central Asia'</i>	25
<i>Item 3002:</i>	<i>BS Media Studies - Review of Curriculum.....</i>	25
<i>Item 3003:</i>	<i>BBA & MBA Programmes - Introduction of New Electives.....</i>	26
<i>Item 3004:</i>	<i>BS(SCM) at PN School of Logistics & Management (PNSLM) – Review of Curriculum</i>	27
<i>Item 3005:</i>	<i>BSS Programme - Inclusion of Modern Languages as Electives</i>	27
<i>Item 3006:</i>	<i>BS Psychology – Addition of Electives "Forensic Psychology" and "Health Psychology"</i>	27
<i>Item 3007:</i>	<i>BS CS & BS IT – Addition of 3 Electives</i>	28
<i>Item 3008:</i>	<i>BEE Programme – Revision of Roadmap for Power Systems Stream.....</i>	29
<i>Item 3009:</i>	<i>BSE Programme – Addition of the Domain "Data Science" and the Elective "Introduction to Data Science" to the new Domain.....</i>	29
<i>Item 3010:</i>	<i>BS Geology, BS Geophysics and BS Environmental Sciences – Changes to Roadmaps.....</i>	30
<i>Item 3011:</i>	<i>LLM Programme – Addition of Electives</i>	30
<i>Item 3012:</i>	<i>MBA3.5 Evening at BULC – Proposal to shift to Weekend format</i>	31
<i>Item 3013:</i>	<i>MBA Technology Management at BUKC – Launch Proposal</i>	32
<i>Item 3014:</i>	<i>LLM in International and Maritime Laws - Launch Proposal.....</i>	33
<i>Item 3015:</i>	<i>MS Law and Business Studies – Launch Proposal.....</i>	33
<i>Item 3016:</i>	<i>Diploma Program in Intellectual Property Laws (Weekend/Evening) at BUIC – Launch Proposal</i>	33
<i>Item 3017:</i>	<i>MS Economics at BUIC – Launch Proposal</i>	34
<i>Item 3018:</i>	<i>PhD Economics at BUIC – Launch Proposal.....</i>	34
<i>Item 3019:</i>	<i>BSS (Development Studies) & BSS (IR) at BUKC – Launch Proposal.....</i>	35
<i>Item 3020:</i>	<i>BS English at BUKC – Launch Proposal</i>	35
<i>Item 3021:</i>	<i>MS Data Science – Launch Proposal.....</i>	36
<i>Item 3022:</i>	<i>Master in Public Health (MPH) – Launch Proposal</i>	37
<i>Item 3023:</i>	<i>BSc(Hons) in Allied Health Sciences for Medical & Dental Technicians – Launch Proposal.....</i>	37
<i>Item 3024:</i>	<i>BS Economics at BUKC – Launch Proposal</i>	38
<i>Item 3025:</i>	<i>LLB at BUKC – Launch Proposal.....</i>	38
<i>Item 3026:</i>	<i>PhD in International Relations - Launch Proposal</i>	39
<i>Item 3027:</i>	<i>Course Withdrawal Rule – Change of Withdrawal Option Period to up to Week-13 from the Current Week-7.....</i>	39
<i>Item 3028:</i>	<i>Final Exam Result – Extension of Submission Period to 7 Days from the Current 3 Days</i>	40
<i>Item 3029:</i>	<i>MBA 1.5 – Expansion of Eligibility Scope.....</i>	41
<i>Item 3030:</i>	<i>BS Thesis – Extension of Submission Timeframe a la MS Programmes.....</i>	42
<i>Item 3031:</i>	<i>Amendments to 'BU Academic Regulations' and 'BU Academic Rules' in the light of HERC Decisions</i>	42
<i>Item 3032:</i>	<i>MBBS/BDS Professional Exams – Common or Separate Exams for FMDC & BUMDC.....</i>	43

<i>Item 3033:</i>	<i>Humanities & Natural Sciences Department at BUKC – Conversion to Humanities & Social Sciences Department.....</i>	44
<i>Item 3034:</i>	<i>MBBS, BDS & DPT Programs – Student Study Guides</i>	44
<i>Item 3035:</i>	<i>LLB Programme – Draft Rules for Final Year Research Project (FYSP).....</i>	44
<i>Item 3036:</i>	<i>Departmental Contingency Budget for Official Activities by Students.....</i>	44
<i>Item 3037:</i>	<i>Final Transcript - Removal of all References to 'F' Grades & Repeated Courses</i>	45
<i>Item 3038:</i>	<i>MSPM at BULC – Regularisation of Admissions made at below the Eligibility CGPA.....</i>	46
<i>Item 3039:</i>	<i>SOP for Students' Exchange with Yeditepe University, Turkey.....</i>	46
<i>Item 3040:</i>	<i>Unified Course Codes for Theses in PG Programmes</i>	47
<i>Decision 3041</i>	47
<i>Item 3042:</i>	<i>Associate Degree in Allied Health Sciences for Dental Technicians.....</i>	48
Any Other Points	48
<i>Decision 3043</i>	48
Closing the Meeting	49
Appendages	49
Appendage 2009	50
Appendage 2643	115
Appendage 2712	117
Appendage 2901-1	124
Appendage 2901-2	127
Appendage 3001	134
Appendage 3003	137
Appendage 3004	146
Appendage 3006	167
Appendage 3007	169
Appendage 3008	176
Appendage 3009	186
Appendage 3010	187
Appendage 3011	196
Appendage 3012	210
Appendage 3013	211
Appendage 3014	230
Appendage 3016	257
Appendage 3017	265
Appendage 3018	301
Appendage 3020	345
Appendage 3021	360
Appendage 3023	387
Appendage 3024	434
Appendage 3025	440
Appendage 3026	452
Appendage 3027	458
Appendage 3028	459
Appendage 3029	460
Appendage 3030	462
Appendage 3031	463
Appendage 3032	464
Appendage 3033	465

Appendage 3036	466
Appendage 3037	467
Appendage 3038	470
Appendage 3039	472
Appendage 3040	476

Acronyms & Abbreviations used in this Document

ACMROB	ACM Rules of Business
CE	Computer Engineering
CS	Computer Sciences
CSE	Computer & Software Engineering
Dean ES	Dean Engineering Sciences
Dean HS	Dean Health Sciences
Dean MSS	Dean Management & Social Sciences
Dean PP	Dean Professional Psychology
Dept	Department
DIC	Director Islamabad Campus
DIPP	Director IPP
DKC	Director Karachi Campus
DLC	Director Lahore Campus
DNCMPR	Director NCMPR
DS	Dental Section BUMDC
EDC	Estimated Date of Completion
EE	Electrical Engineering
EES	Earth & Environmental Sciences
ES	Engineering Sciences
HCU	Head of the Constituent Unit (DG, or Director where no DG)
HNS	Humanities & Natural Sciences
HS	Health Sciences
HSS	Humanities & Social Sciences
iaw	in accordance with
ie	that is
IR	International Relations
MS	Management Sciences/Media Studies
MSS	Management & Social Sciences
SE	Software Engineering
Secy	Secretary to the Academic Council
wef	with effect from

**Minutes of the 30th Meeting of the Academic Council
held on Tue 3rd Oct 2017 by VLC**

Attendance

BUHO

Present

1. Vice Adm (R) Tanveer Faiz HI(M)	Rector	In Chair
2. Rear Adm (R) Shahid Saeed HI(M)	Pro-Rector/DGIC	Member
3. Rear Adm Mukhtar Khan HI(M)	DG IMA	Member
4. Mohammad Ehsan Saeed	Dir Academics	Member & Secy
5. Cdre Muhammad Hisham SI(M)	Registrar	Member
6. Cdre (R) Farrukh Mahfooz SI(M)	DE	Member
7. Captain (R) Imtiaz Khan PN	DA	Member
8. Surg Cdr (R) Hamidullah Arif PN	DHS	Member
9. Prof Dr Shehzad Khalid	Dir PGP	Member
10. Prof Dr M. Najam ul Islam	Dean (ES)	Member

In Attendance

11. Cdre (R) Habib Tariq SI(M)	DF
12. Cdre (R) Naseem Anwar Khan SI(M)	DP&D
13. Cdre Zafar Mansoor Tipu SI(M)	DMPRC
14. Capt (R) Ahmad Farooq Butt PN	DHR
15. Ms. Sundal Mufti	DSA
16. Capt (R) Munawwar Ahmad PN	Dy. Registrar (A & C)
17. Capt (R) Azhar Iqbal PN	DY. Registrar (Academics)
18. Cdr (R) M Khaleeq Khan PN	SO (Coord)
19. Cdr (R) Abdul Ghaffar PN	Dy Director Academics
20. Lt Cdr (R) Ameeruddin Zafar PN	ADREGS
21. Senior Assistant Prof Mr M Awais Mehmood	DDIO
22. Senior Assistant Prof Mr Rizwan Aamir	DDIT

BUIC

Present

23. Cdre (R) Syed Hassan Mustafa SI(M)	Director	Member
24. Senior Prof Dr Tehseen Ullah Khan	HOD(E&ES)	Member
25. Senior Associate Prof Dr Atif Raza Jafri	HOD(EE)	Member
26. Senior Associate Prof Dr Faisal Bashir	HOD(CS)	Member
27. Associate Prof Dr Awais Majeed	HOD(SE)	Member
28. Associate Prof Dr Amina Jameel	HOD(CE)	Member
29. Associate Prof Dr Uzma Masroor	HOD(PP)IC	Member
30. Senior Asstt Prof Mr Waheed Hussain	HOD(Media Studies)	Member
31. Senior Asstt Prof Dr M Ali Saeed	HOD(MS)	Member
32. Senior Asstt Prof Dr Azhar Ahmed	HOD(H&SS)	Member
33. Assistant Prof Ms Malieka Farah Deeba	HOD(LAW)	Member

BUKC

Present

34. Vice Adm (R) K G Hussain HI(M)	DG	Member
35. Cdre Ali Abbas SI(M)	Director	Member
36. Prof Dr Haroon Rasheed	HOD(EE)	Member
37. Senior Prof Dr Farooq-e-Azam Cheema	Dean MSS	Member
38. Senior Prof Dr Mustagis ur Rehman	HOD(MS)	Member
39. Senior Prof Dr Mubarik Ali	HOD(E&ES)	Member

40.	Senior Assoc Prof Mr Ishtiaq Ahmed	HOD(H&NS)	Member
41.	Associate Prof Dr Humera Farooq	HOD(CS)	Member
42.	Associate Prof Dr Sohaib Ahmed	HOD(C&SE)	Member
43.	Senior Lecturer Mahe Darakhshan	HOD(Media Studies)	Member

In Attendance

44.	Prof Dr Bashir Ahmed	PGP Coordinator (MS)
45.	Senior Asstt Prof Dr Naveed Khan	PGP Coordinator (EE)
46.	Ms Erum Shafiq	ADQA

PNSL**In Attendance**

47.	Lt Cdr Syeda Nabila Hassan PN	OIC Exam Cell
48.	Mr Mairaj Hussain	

BULC**Present**

49.	Cdre (R) M Amjad Zaman SI(M)	Director	Member
50.	Senior Asstt Prof Mr Farhan Saeed Sherazi	HOD(CS&IT)	Member
51.	Asstt Prof Dr Muhammad Ahmed	HOD(MS)	Member

In Attendance

52.	Cdr (R) Faisal Shabbir T.Bt PN	Dy. Director
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BUMDC**Present**

53.	Vice Adm (R) Tehseen Ullah Khan HI(M)	DG	Member
54.	Prof Dr Asadullah Khan	Principal & Dean HS	Member
55.	Prof Dr Ambreen Usmani	VP/HOD(Anatomy)	Member
56.	Prof Dr Shakeel Ahmed	HOD(Paediatrics)	Member
57.	Prof Dr Naheed Sultan	HOD(Surgery)	Member
58.	Prof Dr Nasim Karim	HOD(Pharmacology)	Member
59.	Prof Dr Iqbal Hussain Udaipurwala	HOD(ENT)	Member
60.	Prof Dr Khalida Nasreen Abdullah	HOD(Obst and Gynae)	Member
61.	Prof Dr Nighat Rukhsana	HOD(Psychology)	Member
62.	Prof Dr Hasan Ali	HOD(Biochemistry)	Member
63.	Prof Dr Mohiuddin Alamgir	HOD(Pathology)	Member
64.	Pro Dr Surriya Jabeen	HOD(Community Medicine)	Member
65.	Assistant Prof Dr. Mehreen Latif	HOD(MDRL)	Member
66.	Associate Prof Dr Kalsoom Fatima Rizvi	Ag Principal (DS)	Member
67.	Prof Dr Mushtaq Ahmed	HOD(Periodontology)	Member
68.	Dr Shama Asghar	HOD(Preventive Dentistry)	Member
69.	Dr Syed Ahmed Umar	HOD(Dental Material)	Member
70.	Dr Daud Mirza	HOD(Oral Pathology)	Member
71.	Dr Beenish Alam	HOD(Oral Biology)	Member
72.	Senior Assoc Prof Dr Khalid Aziz	Vice Principal (DPT)	Member

In Attendance

73.	Prof Dr Wahab Bukh Kadri	Oral Maxillofacial Surgery
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NCMPR**Present**

74.	Cdr (R) Sajjad Kharby PN	Director	Member
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IPP**Present**

75.	Prof Dr Zainab F. Zadeh	Dean/Director	Member
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Proceedings

Preliminaries

Commencement of the Meeting, Opening Remarks of the Chair and Meeting Schedule

1. With the quorum complete, the proceedings commenced at 10:00 hrs, with recitation from the Holy Quran. The meeting recessed for lunch and namaz at 13:00 hrs and resumed proceedings at 14:00 hrs.
2. In his opening remarks, the Chair stressed the importance for participation in the proceedings while staying focussed on the point under deliberation.

Confirmation of the Minutes of the 29th ACM held on 17th May 2017

3. The Secretary apprised the Council that:
 - a. Draft minutes of the 29th ACM were communicated to all members and non-member participants, for comments, on 24th May. No comments or observations had been received.
 - b. Consequently, the draft minutes were processed on file and the approved minutes were then disseminated on 30th May. There had been no comments or observations on the approved minutes either.
4. The Minutes of the 29th ACM were then tabled for confirmation. All the houses on the VLC endorsed the minutes upon which the Council confirmed the minutes.

Decision

5. Minutes of the 29th ACM held on 17th May 2017 confirmed.

Review Items

Item 2009: Commencement of Indigenous PG Programmes (MPhil & PhD) in Basic Health Sciences at BUMDC
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Responsibility: DG BUMDC, Registrar, DPGP

Decision of the 28th ACM

6. The Council resolved that:
 - a. DPGP and DQA visit BUMDC to ensure that Examination Rules, TOS and Curricula of BUMDC's PG programmes in BHS are aligned with the HEC's and BU's Academic Rules.
 - b. Number of admissions per annum to be decided later.
 - c. NOC be pursued continuously with the HEC.
 - d. Progress to be reported.

Progress Reported by BUMDC (Medical Section)

7. "Annual Intake. As per PMDC rules only intake is allowed once a year in Basic Medical Sciences, M.Phil. Therefore, induction of candidates should be undertaken yearly basis. (References:

The Gazette of Pakistan, Extra, July 18, 2011 (Part-II) Item # 8, clause (1) and item 10, page # 364 & 366). Justification for yearly intake as in other Medical Universities. Information collected verbally on phone through respective admission offices and from websites of universities regarding once per year postgraduate admission.

8. MPhil Programmes in BHS.

- a. *Ministry of Health Services, Regulations and Coordination Notification No F.3/2013-R&S/NHS dated 6th July 2017 has authorised BUMDC to start PG programmes in Anatomy, Pathology and Pharmacology. HEC, vide letter No 1-9/2017/QAD-NOC/HEC/BU/203 dated 9 Jun 2017, has issued NOC to start to MPhil in Pharmacology at BUMDC; NOCs for Anatomy and Pathology are awaited.*
- b. *Process of admission started from 17th July 2017 with deadline for application 18th Aug 2017. Aptitude test at Bahria University Karachi Campus was on 23rd Aug. Interviews were conducted on Mon 28th Aug & List of successful candidates was displayed on 30th Aug. Orientation and classes commenced on 11th Sept with full strength of 4 students in each discipline.*
- c. *Curricula of the three approved MPhil programmes have been revised to bring them in line with HEC's requirements. The revised curricula, placed at Appendage 2009 (page 50), are tabled for approval."*

Pre-Meeting Progress Reported by DPGP

9. "Examination Rules, TOS and Curricula of PG programmes at BUMDC have been aligned with the HEC's and BU's Academic Rules. The same has also been approved in the FBOS meeting of Health Sciences. Updated Roadmaps of PG programmes for the MPhil programmes of Pharmacology, Pathology and Anatomy have been shared with HEC. HEC has already awarded NOC for MPhil in Pharmacology whereas NOCs for MPhil in Pathology and Anatomy are expected soon."

Discussion

10. DPGP apprised the Council on the status of NOC for M Phil Anatomy and M Phil Pathology, from HEC as follows:

- a. MPhil Anatomy: External domain expert was not responding. BU had proposed two names to which HEC had agreed and was to send the case to one of them. Case was being followed up.
- b. MPhil Pathology: HEC required inclusion of lab training in the roadmap and narrowing down the degree specialisation area, the field of Pathology being wide upon. Accordingly, two specialisation areas had been identified. Revised roadmap was being submitted to HEC.

11. DAcad. observed that courses in the three curricula had long list of Objectives, some Outcomes and a few lines of Outlines. He highlighted the standard practice of stating the intention in the Objectives, the end results as the Outcomes and a detailed plan to convert the intention into results, in the Outline. With that the curricula of the three programmes was approved. The Chair appreciated BUMDC for starting the programmes, and DQA and DPGP for pursing the programmes at HEC and for aligning the curricula with HEC's and BU's academic rules. The Chair also approved one-intake per annum, and asked for progress to be reported.

Decision 30(2009)

12. a. Revised syllabi for MPhil Anatomy, MPhil Pathology and MPhil Pharmacology, as at Appendage 2009 (Page 50), approved.
- b. Intake into PG Programmes at BUMDC shall be once in a year.
- c. Point to remain on agenda and progress reported.

Action Required	Action by	Responsibility of
Implementation of the Decision 'a' & 'b'	Dean HS	DG BUMDC
Implementation of the Decision 'c'	Registrar	Registrar
Statutory Documents affected: Programmes Roadmaps, Prospectuses		

Item 2234: Bahria University Lahore Campus – Progress Report

Responsibility: DLC, DQA

Decision of the 28th ACM

13. a. 5% waiver in admission criterion for BBA and BSIT programmes approved for Fall 2017 admissions.
- b. BULC is to focus on forthcoming accreditation visits for BS(IT) & BS(CS) programmes and induction of more PhD faculty members.
- c. A team headed by Dean ES is to follow-up on the Mock Audit and ensure that deficiencies pointed out earlier have been made good.
- d. BS Professional Psychology not approved for the time being. The Campus is to stabilize first. Launch of programme will be considered subject to successful accreditation visit and construction of the 4th floor.
- e. Progress to be reported.

Pre-Meeting Progress Reported by DLC

14. “Admissions.”

- a. *Admissions Campaign for Fall-17 is in progress. 5% waiver in admission criterion for BBA & BSIT is being offered in Fall 2017 Admissions. 5% waiver availed so far in Phase-I admissions as under:*

Program	No. of Students Availed Waiver	Total Class Strength	% of Students Availing Waiver
BBA	1	6	17%
BSIT	4	24	16%

- b. *A number of universities and institutions at Lahore exercised 45% eligibility criteria for BBA and BSIT programs. BULC may be allowed to use the facility of 5% waiver in Spring-18 admissions of BBA and BSIT programs as well*

15. Academics.

- a. *BULC preparing for Accreditation Visit, Observations of 2nd Mock Audit being addressed.*
- b. *Hiring of faculty for (CS) completed.*
- c. *Construction of 4th floor by Bahria Foundation is in progress and likely to be completed by end of Sep 17. The accreditation of CS department is due in Fall-17. On successful completion of both targets, BULC may start BS Psychology in Spring 18.*

16. Civil Works.

- a. *Construction of additional 4th floor is in progress and likely to be completed by Sep/Oct 17. Revised rent rates, proposed by the Bahria Foundation may be considered on completion of the 4th floor and through fresh rental lease agreement between Bahria University and Bahria Foundation as recommended vide BULC letter BULC/Gen/2017/77 dated 17 Feb 17.*
- b. *50 kanals land has been purchased and another 50 kanals are being acquired for establishment of new campus at Dream Gardens society at Defence Road Lahore. Shortlisting of consultant firm is in process at BUHO."*

Pre-Meeting Progress Reported by DQA

17. Three-day Mock Audit of the BS CS & BS IT programmes of the Campus was conducted on 11-13 July. Corrective Action Plan-II for the said programs, duly approved by the Rector has been sent to concerned officials. Review of the Corrective Action Plan will be held in Mid Sept as desired by the Rector.

Discussion

18. Dean ES briefed on readiness of the BS CS and BS IT programmes for accreditation, suggesting that the Dept was ready; there were few deficiencies which the Dept had been asked to rectify by 9th Oct.

19. On BS Psychology, concern was raised on lack of space. DLC informed that the CU had two classrooms and one lab to cater to 25 BS Psychology students. Dean PP endorsed, stating 3-4 classrooms would serve the purpose. She added that BS Psychology had good prospects in Lahore and that there was no issue with acquiring the required faculty. Dean ES was of the view that whereas it was important to start a third department to justify a campus, equally important was providing a good workplace environment to the faculty, including lab engineers.

20. Winding up the discussion, the Chair approved BS Psychology, subject to satisfactory accreditation visits and completion of the 4th floor. The CU's request for 5% admission waiver was also acceded to.

Decision 30(2234)

21. a. BULC permitted to start BS professional Psychology wef Fall 2018 subject to successful accreditation visits in respect of BS CS and BS IT and completion of the 4th floor.
- b. 5% admission waiver for BBA and BS IT programmes extended to Spring 2018 intakes.
- c. Point to remain on agenda and progress reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DLC	DLC
Statutory Documents affected:	-	

**Item 2331: Audit Documentation and Reporting in the Faculty of Management Sciences,
Status of**

Responsibility: Dean MSS

Decision of the 28th ACM

22. Point to remain on the agenda and progress be reported.

Pre-Meeting Progress Reported

23. *"Audit manual has been approved and promulgated. Audit standards for the various departments under the Faculty of M&SS, the Faculty of Psychology and the BUMDC have been formulated and the process of self-audit and mock audit is in practice across the university."*

24. *Furthermore, the NBEAC standards are apportioned into various performance centers at the Head Office and the Islamabad Campus for their implementation at the respective centers and reporting the performance to the Management Sciences Department. The entire structure and process was got approved by the competent authority and implemented. This month Dean M&SS shall be conducting meeting with each Performance Center to guide and facilitate them in understanding the standards and the form of performance arising out of implementation of those standards. Audit of the function of the performance centers shall be conducted at the end of the Fall 2017 semester.*

25. *As a second, the NBEAC standards apportioned among the Performance Centers were also reconciled with the NCEAC and PEC standards. Resultantly, the performance outcome of the Performance Centers is relevant to computing and engineering departments also."*

Discussion

26. Dean MSS reviewed the background to the audit regime which had been put in place and the recent establishment of 12 Performance Centres for facilitating university wise audit performance and helping the departments prepare for accreditation visits. He informed that the system was fully implemented and mature at the BUIC; for BUKC and BULC, performance Centres would be instituted after the accreditation visits by NBEAC. HOD MS BUIC requested readiness for accreditation visits at short notice because of Performance Centres. Expressing satisfaction, the Chair directed to keep the point on agenda and progress reported.

Decision 30(2331)

27. Point to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs	Deans
Statutory Documents affected:	-	

Item 2334: BBA & MBA programmes – Heuristic & Flipped Classroom Methods of Teaching & Evaluation

Responsibility: DIC, DKC, DLC, Dean MSS

Decision of the 28th ACM

28. HoDs are to focus on Flipped Classroom methodology. Increasing the scope of the methodology left at the discretion of the Campuses. Progress to be reported.

Pre-Meeting Progress Reported

29. DIC. MS Department has converted Hall # 5 into Flipped Classroom. Same is being used to conduct classes on modern pattern.

30. DKC 2nd semester of Flipped class has finished and ready to start its 3rd semester in Fall 2017. This semester three new courses are being taught on Flip class methodology. Preparation for the same are in progress.

31. DLC. In the forthcoming semester, three courses will be taught under the flip class teaching methodology. Training for heuristic teaching methodology will be organized between 11th and 15th September. All the faculty members (existing as well as new) will be attending the workshops. BULC has established a small flip classroom from its own resources in order to facilitate flip class teaching methodology. Approval from the BUHO is however still awaited to enhance the subject facility to a regular size classroom as per other BU CUs.

32. Dean M&SS. The Flipped Classroom teaching methodology program is gaining ground. Teachers are being trained at local level in use of IT in the teaching methodology. Preliminary meetings of the HODs with the faculty members engaged in the FC class method have been held in connection with the Fall 2017 semester. Special measures are being taken to make maximum avail of the IT into the teaching methodology.”

Discussion

33. HODs MS BUIC and BUKC briefed the Council on the status of Flipped Class methodology. The former viewed that the department was partially on methodology and stressed the importance of shifting to technology for better results; HOD MS BUIC stated that the methodology was well entrenched through a number of section and titles, and highlighted the importance of change in Scheme of Examinations, ie deletion of either Mid-Term or Final Exam. Dean MSS echoed HOD MS BUKC's views. The Chair directed further progress on the case.

Decision 2334

34. Point to remain on agenda and progress reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs MS	Dean MSS
Statutory Documents affected: -		

Item 2432:	MS Supply Chain Management at BUKC – Progress
Item 2619:	MS in HRM & Organizational Psychology at BUKC – Progress
Item 2620:	MS in Risk Management at BUKC - Progress

Responsibility: Registrar

Decision of the 28th ACM on all three Items

35. Progress be reported.

Pre-Meeting Progress Reported

36. “MS-MS program has been approved by the HEC. The department is now working to get approved rest two programs i.e MS Finance and MS Project Management. For MS Finance out of the two selected PhD faculty members, one has already joined. However, Project Management PhD faculty selected is not available this semester and has requested for extension in offer letter till December 2017. Hiring of relevant PhDs is in progress.

37. Cases with HEC for NOC since various timeframes (Case 2432 since Nov 2015, Case 2619 since May 2017, Case 2620 since Oct 2016); cases clubbed together seeking independent faculty for each.”

Discussion

38. These three items were taken up together, being in the same league viz NOC from HEC, where they had been clubbed together and held up for BU for provide separate faculty for each. DPGP gave the status of faculty for each programme as follows:

- 2432 SCM: Faculty awaited
- 2419 HRM&OP: Faculty available; case being fast tracked
- 2420 MS RM: Faculty not available

39. DPGP apprised the house that HEC accepted PhD in related fields only and sought abstracts of thesis or publications as evidence. Registrar referred to a serving naval officer at Karachi with PhD in Project Management who could be relevant to MSRM. The chair asked for following up cases at the HEC and approval of MS HRM & OP at least.

Decision 30(2432, 2619, 2629))

40. NOC for the Programmes be followed up at the HEC, particularly for MS HRM & OP. Points to remain on agenda and progress reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:		

Item 2449: BUMDC Dental Section – Progress Report

Responsibility: DG BUMDC

Decision of the 28th ACM

41. a. Dental College is to prepare for re-inspection by PMDC; all previous observations are to be rectified before the inspection.
- b. BUMDC is to pursue the additional 25 seats in BDS aggressively.
- c. Dental Section is to continuously prepare for PG programmes.
- d. Dean Health sciences is to play effective role in Dental Section's pursuit of the said objectives.
- e. Progress be reported.

Pre-Meeting Progress Reported

42. Following progress was reported by the Principal (Dental Section):
- a. *"All observations are rectified. PMDC will be re-invited for re-inspection after joining the replacement of resigned faculty members."*
- b. *"For additional 25 seats in BDS, infrastructure and additional equipment is required. CFA approval has been obtained and consultant was hired. However, despite of tendering twice in newspaper yet the contractor has not been finalized. Tendering of equipment is awaited for award of contract for construction work first."*
- c. *"CPSP will be approached for re-inspection of college for accreditation of FCPS & MCPS programmes in Clinical Dental Section at the BUMDC Dental Section after receipt of recognition certificate for 50 seats from PMDC and preparation of 75 admissions is complete."*
- d. *"Dean Health Sciences is involved in all affairs of Dental College."*

Discussion

43. DHR apprised the Council that the new Principal and faculty members of Dental Section would join by 6th and 16th Oct respectively. The Chair directed that PMDC be pursued for re-inspection after the joining of new Principal and faculty members.

Decision 30(2449)

44. PMDC be pursued for re-inspection after the new principal has taken over and new faculty members joined. Point to remain on agenda and progress reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal Dental Section BUMDC	DG BUMDC
Statutory Documents affected:	-	

Item 2511: MSMS Program – Progress (ex- MPhil Programmes - Change of MPhil Nomenclature to MS)

Responsibility: Registrar

Decision of the 28th ACM

45. Progress be reported.

Pre-Meeting Progress Reported

46. “NOC received on 9 June 2017. Programs were advertised at both BUIC and BUKC. At the former, the program has started with 9 students. At the latter, 3 students were enrolled who, because of short number, were transferred to the MPhil class.”

Discussion

47. HOD MS BUKC referred to late advertisement as a possible cause for lukewarm response to the programme and anticipated better results in Spring 2018. He asked for continuing MSMS and MPhil MS in parallel until the situation stabilized, which was approved for BUIC too. To a query he responded that MSMS would be run as an evening programme to strengthen these (evening) programmes which were otherwise considered weak.

Decision 30(2511)

48. BUKC & BUIC may run MSMS and MPhil MS in parallel till the situation stabilized or directed otherwise. Point to remain on the agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision (progress on MSMS)	HOD MS BUKC	DKC
Statutory Documents affected:	-	

Item 2519: PhD in Management Sciences at BULC - Progress

Responsibility: DLC

Decision of the 28th ACM

49. Progress be reported.

Pre-Meeting Progress Reported

50. “With the joining of another PhD in MS department on 21st Aug, HEC’s requirement of three PhDs to launch PhD program in the department has been fulfilled. The case has been forwarded to BUHO for further submission to HEC.”

Discussion

51. Registrar apprised the House that the case was received on 28th Sep and had been sent to HEC promptly. The Chair asked for progress to be reported.

Decision 30(2519)

52. Progress on the case to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	-	

Item 2613: MS(Information Security) at BUIC – Progress

Responsibility: DIC

Decision of the 28th ACM

53. The Council was informed that NOC from HEC had been received the day before. The Council asked for progress to be reported.

Pre-Meeting Progress Reported

54. *"Program has commenced in the current semester with 30 students."*

Discussion

55. To a query from the Chair, HOD CS BUKC stated that faculty and lab were not available to run the programme at the BUKC, and that adding electives on Info Security to the MS CS programme was a better option. The Chair expressed satisfaction on the programme's progress at the BUIC and dropped the point. He also asked the Registrar to write to Chairman NESCOM about the programme.

Decision 30(2613)

56. "MS(Information Security) at BUIC" dropped.

Item 2615: MS Mathematics at BUIC – Progress

Responsibility: DIC

Decision of the 28th ACM

57. Revised roadmap for MS Mathematics ratified. Progress be reported.

Pre-Meeting Progress Reported

58. *"Program has commenced in the current semester with 14 students."*

Discussion

59. Progress on the programme was considered satisfactory and the point dropped.

Decision 30(2615)

60. Point dropped.

Item 2616: MS Mathematics (ex-MS Applied Mathematics) at BUKC - Progress

Responsibility: Dean ES, DKC

Decision of the 28th ACM

61. a. Programme retitled as “MS Mathematics” and to be run by the CS Dept, on the same lines as at BUIC.
- b. Before the case is forwarded to HEC, Dean ES is to align the programme curriculum and roadmap with the ones approved by HEC for BUIC.
- c. Progress be reported.

Pre-Meeting Progress Reported

62. **Dir BUKC** “Approval of programme from HEC is in process. Necessary coordination with HEC is in progress.”

63. **Dean ES** “The proposed MS Maths Curriculum for BUKC has been revised and aligned with the already approved HEC curriculum for BUIC.”

Discussion

64. DPGP apprised the house that NOC was in advanced stages at the HEC and would be given soon. The Chair asked for progress to be reported.

Decision 30(2616)

65. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	-	

Item 2621: MS EE (Weekend) at BUKC – Progress

Responsibility: DKC

Decision of the 28th ACM

66. Progress be reported.

Pre-Meeting Progress Reported

67. “Program was advertised for weekend format in the final advertisement. Accordingly, candidates applied for MS (EE) in Regular and Weekend programs. 12 Students have enrolled in the evening programme and 10 in the weekend.”

Discussion

68. Expressing satisfaction over progress of the programme, the point was dropped.

Decision 30(2616)

69. Point dropped.

Item 2643: Grooming Students, Framework for

Responsibility: Dean MSS, Dean ES

Decision of the 28th ACM

70. Progress be reported.

Pre-Meeting Progress Reported

71. Dean M&SS.

- a. "Student grooming program has now been formally incorporated into the BU Students Career Services that include:
 - Personality grooming through curriculum
 - Personality grooming through co-curricular and extra-curricular activities
 - Career counseling
 - Internship support
 - Placement support
- b. To execute the students career services, BU Students Career Services Manual has been promulgated and Departmental Career Services Coordinators have been nominated among the faculty members with remitted course load.
- c. Dean M&SS conducted an orientation session on the BU students career services on June 22, 2017 which was attended by the Deans, Directors Campus, DLDC, DSA, HODs and Departmental Career Services Coordinators. The session was chaired by the Pro-Rector BU. Later, Dean M&SS conducted training of the Departmental Career Services Coordinators at all three campuses regarding their duties given in the manual.
- d. After promulgation of the manual LDC has been assigned its role of non-compliant courses through workshops."

72. Dean ES. "The course outlines of relevant courses aligned with grooming framework (proposed by Management Sciences) have been revised. The outlines were revised by committee consisting of members of each discipline offered by Faculty of Engineering Sciences. The departments are implementing the revised outlines w.e.f. Fall'2017. A review of the changes would be carried out at the end of Fall semester."

73. Dean PP. "Decision Implemented."

Discussion

74. Dean ES presented revised outlines to meet the requirements of the Outcome Based Education law the Washington Accord; presentation transcript is placed at Appendage 2643 (page 115). The Chair asked the Dean to formulate policy guidelines on implementing the Washington Accord. The Chair expressed satisfaction over the grooming programmes and asked for keeping the item on the agenda.

Decision 30(2643)

75. a. Point to remain on agenda and progress to be reported.
 b. Dean ES to formulate policy guidelines on implementing the Washington Accord.

Action Required	Action by	Responsibility of
Implementation of the Decision 'a'	HODs	Deans
Implementation of the Decision 'b'	Dean ES	Dean ES
Statutory Documents affected:		

Item 2707: BS Economics Programme at BUIC – Progress

Responsibility: DIC

Decision of the 28th ACM

76. Progress be reported.

Pre-Meeting Progress Reported

77. *"Program has commenced in the current semester with 21 students."*

Discussion

78. Reviewing the first intake, HOD MS BUIC apprised the Council that 21 students had been inducted against the target of 30 and hoped that intake and quality would improve progressively. To chair's query on residence of this programme, HOD MS BUIC was of the view that the programme should stay in the Dept of MS that had the entire Economics faculty. Dean MSS suggested that Economics was traditionally a part of the MS Dept or a separate Dept but could also be taken to the Social Sciences Dept. DAcad suggested that being a social science, all Economics programmes needed to be run by the Social Sciences Dept which in BU's current structure was the Humanities and Social Sciences Dept. Winding up the discussion, the Chair expressed satisfaction over the initial induction and dropped the point.

Decision 30(2707)

79. Point dropped.

Item 2709: MS Islamic Banking & Finance at BUIC – Progress

Responsibility: DIC

Decisions of the 28th ACM

80. Progress be reported with particular reference to collaboration with the Mezan Bank and the State Bank of Pakistan.

Pre-Meeting Progress Reported

81. *"Pending approval of HEC. The case is pending with two subject experts."*

Discussion

82. HOD MS BUIC stated that the case was with the HEC's QAD which had some minor observations expected to be emailed in due course. He gave following status of MOUs with the banks:

SBP: Meeting being arranged.

Al Falah: MOU signed

Mezan: In agreement with draft MOU

83. The Chair asked for progress to be reported.

Decision 30(2709)

84. Progress on NOC and MOUs with the banks be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision (NOC)	DPGP	Registrar
Implementation of the Decision (MOUs with banks)	HOD MS BUIC	HOD MS BUIC
Statutory Documents affected:	-	

Item 2710: MS Marketing & Sales at BUIC – Progress

Responsibility: DIC

Decisions of the 28th ACM

85. Progress be reported with particular reference to collaboration with the Meezan Bank and the State Bank of Pakistan.

Pre-Meeting Progress Reported

86. *"Program has commenced in the current semester with 13 students."*

Discussion

87. HOD MS BUIC apprised the Council that 13 students were admitted against a target of 15-20 and attributed the reason for low turnout to HEC's admission criterion which asked for relevant previous education. The Chair asked the HOD to approach the concerned people at HEC for expanding the admission scope. He also asked for the point to be kept on the agenda.

Decision 30(2710)

88. Point to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:		

Item 2712: PhD Software Engineering at BUKC – Progress

Responsibility: Registrar

Decision of the 28th ACM

89. Progress be reported.

Pre-Meeting Progress Reported by HOD CSE BUKC

90. "HEC has sought six additional Electives. Further, 21 electives ex-MS programmes in SE and CS have been added and 24 electives deleted. The changes, listed at Appendage 2712 along with description of the courses added, are tabled for approval."

Discussion

91. Dean ES hoped for the NOC before the start of the next admission cycle as the HEC's observations were minor, like the requirement of certified minutes of the ACMs to accompany the case. The changes listed at Appendage 2712 were approved and progress was asked to be reported.

Decision 30(2712)

92. Changes to PhD SE roadmap, listed at Appendage 2712 (page 117), approved. Progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected: Roadmaps, Curricula and Prospectus		

Item 2713: PhD Program in Environmental Sciences at BUIC – Progress

Responsibility: DIC

Decision of the 28th ACM

93. Progress be reported.

Pre-Meeting Progress Reported

94. NOC from HEC received on 3 May 2017 and the programme was advertised for Fall 2017 admissions. 12 applied; 7 appeared in the Admission Test and 5 cleared; 4 admitted to the programme.

Discussion

95. HOD EES BUIC briefed on the initial intake. The Chair asked for the point to remain on agenda.

Decision 30(2713)

96. Point may remain on the agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD EES BUIC	DIC
Statutory Documents affected:	-	

Item 2722: Doctor of Physical Therapy Programme – Progress Report

Responsibility: DE, DG BUMDC

Decision of the 28th ACM

97. The Council resolved that:

- a. Curriculum for the DPT programme, as at Appendage 2722 to Minutes of the 28th ACM (separate document), approved.
- b. TOS and Examination Rules for the DPT programme entrusted to a committee headed by Director Examinations with the following members, for their alignment with the BU's Academic and Examination Rules:
 - (1) Director Health Sciences
 - (2) Principal Physiotherapy Section BUMDC
 - (3) Dr Alamgir
- c. Organizational structure of BUMDC, taking into consideration the set-ups for Physical Therapy and Nursing, be taken up separately.
- d. Progress be reported.

Pre-Meeting Progress Reported by Vice Principal Physical Therapy Section

98. *"a. Two faculty members are already hired.*
- b. Civil work for two labs and faculty room are almost complete.*
 - c. Purchase of equipment for Labs is in Process, Re-Tender will be opened on 18th Aug.*
 - d. First semester exam of DPT has finished. Results are awaited and 2nd Semester will start from 11th Sep 2017. New batch will be inducted in Spring 2018 and classes will commence in first week of Feb 2018. Admission process for new batch will be along with the MBBS and BDS admission.*
 - e. DPT curriculum (HEC's National Curriculum-2016 for DPT programme) was approved by the 28th ACM in April 2017. By then, the first batch had already joined two months earlier and was put on HEC's National Curriculum-2011. For the purpose of regularisation, it is proposed that the First Batch inducted in Feb 2017 may remain on the 2011 Curriculum and subsequent batches be shifted to the 2016 Curriculum."*

Pre-Meeting Progress Reported by the DE

99. *"Draft TOS and Examination Rules were processed on file and approved. Approved copies have been handed over to the Dean Health Sciences and the Vice Principal DPT Section BUMDC."*

Discussion

100. DG BUMDC informed the Council that the retendering process had completed and the Purchase Orders were with the BUHO for approval. To queries from the chair, VP DPT Section replied that whereas there were only slight difference in the 2011 and 2016 curricula ie slight shifting of subjects and addition of microbiology, it was not possible to shift the 2017 batch to 2016 curriculum because they were already into the 2nd semester. Ag DQA viewed with that there could be problems in the accreditation process if two curricula were run as suggested by the DPT Section. DAcad opined that changes to roadmaps and curricula were a routine matter and whenever that happened, it was usual for two roadmaps/curricula to run in parallel, at any institute. With that, 2011 curriculum for the 2017 batch, and 2016 for the coming batches were approved. TOS and Examination Rules, already approved on file, were also ratified. The Chair asked for further progress on the case to be reported.

Decision 30(2722)

101. a. 1st (2017) DPT Batch shall remain on the 2011 curriculum. Subsequent batches shall be on the 2016 curriculum.
- b. TOS and Examination Rules for DPT, approved on file, ratified.
- c. Point to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	VP DPT Section	DG BUMDC
Statutory Documents affected: TOS, Examination Rules, Curricula, Roadmaps, Course Code Handbook		

Item 2817: MBA Pharmaceutics and Health Management – Progress (ex-MBA Pharmaceutical and MBA Health Management)
Responsibility: DKC

Decision of the 28th ACM

102. MBA Pharmaceutical and MBA Health Management merged into a single programme to be titled “MBA Pharmaceutics and Health Management” wef Fall 2017 inductions. Progress to be reported.

Pre-Meeting Progress Reported

103. *“Program will be offered later in September, being on the trimester (weekend) format.”*

Discussion

104. Updating on the status, HOD MS BUKC stated that the programme had been unable to attract students. To queries from the Chair, the HOD responded that the existing students were in the final semester and that a feasibility study for the programme had indeed been carried out but it did not work, possibly due to other medical universities in Karachi offering the same programme. The Chair asked for the point to remain on agenda.

Decision 30(2817)

105. ‘MBA Pharmaceutics and Health Management’ to remain on the agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD MS BUKC	DKC
Statutory Documents affected:		

Item 2818: MBA Banking at BUKC - Progress

Responsibility: DKC

Decision of the 28th ACM

106. MBA Banking approved for launch at the BUKC, in the 2.0 & 3.5 weekend formats, wef Fall 2017. BUKC to make all efforts to sign an MOU with the IBP before the programme launch. Progress to be reported.

Pre-Meeting Progress Reported

107. “MOU was signed with IBP on 18 Aug and roadmap is ready. Program will be offered later in September being on the trimester (weekend) format.”

Discussion

108. Updating on the status, HOD MS BUKC apprised the Council on programme’s offering in Dec. The day after the ACM, on 4th Oct, Dean MSS was asked to contact HEC on the requirement to seek their NOC if MBA Banking and MBA Technology Management were to be offered as exclusive degrees as opposed to MBA majors. HEC responded that NOC would indeed be needed. Upon which the Chair asked for this programme and MBA Technology Management (Item 3013) to be pended for the time being.

Decision 30(2818)

109. “MBA Banking at BUKC” pended for the time being.

Item 2820: PhD Mathematics at BUIC – Progress

Responsibility: Registrar, DIC

Decision of the 28th ACM

110. The Council resolved that:

- a. PhD Mathematics approved for launch at BUIC wef Spring 2018, subject to NOC from the HEC
- b. A Department of Mathematics at BUIC, under the Faculty of Engineering Sciences, approved in principle, wef Spring 2018.

- c. Progress to be reported.

Pre-Meeting Progress Reported

111. “NOC from HEC has been received on 27th Sep.”

Discussion

112. There was no discussion on the programme as the NOC had just been received. However, the previous decision of raising the Mathematics Dept was reviewed and pended for the time being. Progress was asked to be reported.

Decision 30(2820)

- 113. a. Progress on the programme to be reported.
- b. Department of Mathematics at BUIC pended for the time being. Programme to be run by the CS Dept.

Action Required	Action by	Responsibility of
Implementation of the Decisions	HOD CS BUIC	DIC
Statutory Documents affected: -		

Item 2821: PhD in Law at BUIC – Progress

Responsibility: Registrar

Decision of the 28th ACM

114. PhD in Law approved for launch at BUIC wef Spring 2018 subject to NOC from HEC and, if required, from PBC.

Pre-Meeting Progress Reported

115. “Case forwarded to HEC on 4 July 2017.”

Discussion

116. The Council was apprised that there had been no observation from the HEC until then. Progress was asked to be reported.

Decision 30(2821)

- 117. Progress on the programme to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected: -		

Item 2832: Collaboration with ABE, UK, for Joint Programs

Responsibility: HOD(MS)IC

Decision of the 28th ACM

118. Collaboration with ABE UK, under a proper agreement approved. Progress to be reported.

Pre-Meeting Progress Reported

119. *"The decision pertaining to approval by BU's ACM regarding adaption of ABE course outline for the Entrepreneurship course was communicated to ABE, with request to share the copy of MoU that is to be signed to initiate this arrangement. Due to change in management at their end, they have been slow in responding. As per last correspondence, they are in process of finalizing the MoU that they will share in due course of time."*

Discussion

120. To the Chair's query, it was informed that both the HOD MS BUIC and the IO were handling the case. The Chair asked for progress to be reported.

Decision 30(2832)

121. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD MS BUIC, IO	HOD MS BUIC
Statutory Documents affected:	-	

Item 2834: PhD Media Studies at BUIC – Progress

Responsibility: Registrar

Decision of the 29th ACM

122. PhD Media Studies approved for launch at the BUIC, subject to NOC from the HEC, wef Spring 2018. Progress to be reported.

Pre-Meeting Progress Reported

123. Registrar. *"Case is still under process at Department Level."*

124. HOD Media Studies IC. *"Case has been initiated with HEC, Reply awaited."*

Discussion

125. HOD MS BUIC briefed that HEC's requirement viz certified documentation had been met and NOC was awaited. The Chair asked for progress to be reported.

Decision 30(2834)

126. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected: -		

Item 2838: MS Media Studies at BUKC – Progress

Responsibility: Registrar

Decision of the 29th ACM

127. MS Media Studies at BUKC approved subject to NOC from HEC, wef Fall 2017. Progress to be reported.

Pre-Meeting Progress Reported

128. Registrar. *"Case forwarded to HEC on 7 July 2017."*

129. Dir PGP.

- a. *"The roadmap of MS Media Studies and Communication has been reviewed during a VLC meeting between Media Studies department at Islamabad and Karachi Campus and PGP Dte. It was observed that the current roadmap of HEC and the same followed at BUIC requires changes to make it more effective and practical. However, in order to expedite the NOC case of MS Media at BUKC by showing its alignment with HEC and already approved programme at BUIC, it was decided to follow the same roadmap of BUIC as approved for BUIC. After acquisition of NOC from HEC, changes in roadmap as recommended by experts of Media Studies may be presented and approved in upcoming FBOS and ACM."*
- b. *"The NOC case for MS Media Studies and Communication at BUKC has been submitted to HEC in July 2017 and response from HEC is awaited."*

Discussion

130. There was no discussion and the Chair asked for progress to be reported.

Decision 30(2838)

131. Progress on the programme be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected: -		

Item 2901: HEC's New Academic Rules (HECAR), Review of

Responsibility: Dean ES

Decision of the 29th ACM

132. A committee of Dean ES (Head), DPGP, DQA, HOD MS IC and PG Coordinator MS Dept KC to take the DAcad Committee's work forward and propose changes to the BU Academic Rules to accommodate the HECAR where required for betterment of the University, in the Mid-August timeframe.

Pre-Meeting Progress Reported

133. *"The Committee presented its report to members of the Academic Council on 14 Sep by VLC. Approved recommendations of the Committee are placed at Appendage 2901-1, soliciting ratification by the Council. Academic Rules enacted from the approved recommendations are placed at Appendage 2901-2 for consideration and approval of the Council."*

Discussion

134. Approved recommendations from the VLC of 14th Sep, placed at Appendage 2901-1 (page 124) were tabled and ratified. DAcad then presented the Academic Rules enacted or modified from the approved recommendations, and placed at Appendage 2901-2 (page 127). The presentation, placed at the end of Appendage 2901, focussed on the main amendment – change of programme durations – and associated definitions and clauses, and presented a snapshot of deletions, amendments and additions. The Council unanimously approved the new and amended Academic Rules. The Council also approved to let the existing students avail the fruits of new rules where they helped them, like the new programme durations, courses on Pass/Fail basis, students grievances, damaged/lost answer sheet, facilitation to handicapped students or any other clause. The point was then dropped.

Decision 30(2901)

135. a. Approved recommendations from the 14th Sep VLC, placed at Appendage 2901-1 (page 124) ratified.
- b. Proposed Changes to Academic Rules, placed at Appendage 2902-2 (page 127), approved.
- c. New/amended Academic Rules shall be effective from Spring 2018 intakes. However, current students, from pre-Spring 2018 batches, will also be eligible to avail the fruits of these changes if helpful them, specifically, but not limited to, the following:
- (1) Programmes' New Durations.
 - (2) Courses on Pass/Fail basis in UG Programmes.
 - (3) Students' Grievances.
 - (4) Damaged or Lost Answer Script.
 - (5) Examination Writer for Special Students.
- d. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs	Deans, HCUs as applicable
Statutory Documents affected:	Academic Rules, Faculty Handbook, Students Handbook, Examination Policy	

New Items

Item 3001: MS IR - Inclusion of Elective 'Central Asia in International Politics,

Sponsor: HOD(HSS)BUIC

Referral Authority: FBOS MSS

Summary of the Case

136. The case was based on the following premise:

- a. Central Asia, due to its rich hydro-carbon reserves, an important region in the post-Soviet Union era, despite being landlocked.
- b. Regional and international players taking increased interest in the region, as evident from Pakistan and India joining the SCO.
- c. Students understanding of the region would increase significantly.

137. The course was to focus on the national politics, and regional and international relations of Afghanistan, Tajikistan, Uzbekistan, Turkmenistan, Kyrgyzstan and Kazakhstan. The themes selected for the course included political and social change, economic modernization and regional security against the backdrop of sectarian, ethnolinguistic and ideological diversity, outside interference and geopolitical rivalry. Course outline is attached as Appendix 3001 (page 134).

Discussion

138. HOD(HSS)BUIC presented the case; presentation transcript is placed at the end of Appendix 3001. After a brief discussion, the inclusion of the said elective in the curriculum of MS IR was approved. DPGP proposed raising the course level to 700 to help PhD students to benefit from the programme; this was agreed to.

Decision 3001

139. The Elective 'Central Asia in International Politics' approved for inclusion in the roadmap of MSIR and to be level 700. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD HSS BUIC	HOD HSS BUIC
Statutory Documents affected:	Course Code Handbook, Curriculum, Prospectus	

Item 3002: BS Media Studies - Review of Curriculum

Sponsor: HOD(Media Studies)BUKC

Referral Authority: FBOS MSS

Summary of the Case

140. Department of Media Studies BUKC proposed revision of roadmap/curriculum of the BS(MS) programme.

Discussion

141. Since no working paper and associated documents had been received with the agenda, HOD(Media Studies) BUKC presented the roadmap ab initio, going course-by-course on to describe what was being changed and what was not being changed, thereby losing the focus of the case. The presenter was interrupted after about 20 minutes and asked to re-present the case at the next ACM with focus on changes only. Later, when the house was opened for the points, DG BUKC requested moving the case on file to save time which was agreed to.

Decision 3002

142. Proposed changes to the BS (Media Studies) curriculum to be moved on file. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD Media Studies BUKC	Dean MSS
Statutory Documents affected:	Roadmap, Curriculum, Prospectus	

Item 3003: BBA & MBA Programmes - Introduction of New Electives

Sponsor: HOD(MS)BUKC

Referral Authority: FBOS MSS

Summary of the Case

143. The case proposed addition of the following courses to the BBA and MBA curricula, in the indicated fields:

- a. Product Management (Marketing)
- b. Distribution Management (Marketing/Supply Chain Management)
- c. Digital Analytics (Marketing/MIS)
- d. Introduction to Big Data Analytics (MIS)
- e. Electronic CRM (E-CRM) (Marketing/MIS)

144. It was suggested that the new courses would help diversify and reinvigorate these programmes. Working paper and courses outlines are as Appendage 3003 (page 137).

Discussion

145. The Council found the additional electives pertinent and approved them.

Decision 3003

146. Electives referred to at para 143, with details at Appendage 3003 (page 137) approved for inclusion in the BBA and MBA curricula. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs MS	Dean MSS
Statutory Documents affected:	Roadmaps, Curricula, Prospectuses	

Item 3004: BS(SCM) at PN School of Logistics & Management (PNSLM) – Review of Curriculum

Sponsor: HOD(MS)BUKC

Referral Authority: FBOS M&SS

Summary of the Case

147. As per instruction of the Competent Authority of Bahria University, curriculum of BS(SCM) at the PNSLM was carried out by a committee headed by the Dean (M&SS). The curriculum had been updated in accordance with the HEC guidelines on curriculum design. The reviewed curriculum, attached in Appendage 3004 (page 146), was tabled for consideration and approval of the Council.

Discussion

148. Dean MSS reviewed the background to the revision of the BS(SCM) curriculum at the PNSLM. Rep from the School suggested inclusion of 'Research Project' vice the 'Logistics and Secretariat Management' course in the last semester to which Dean MSS had no objection and was, therefore, approved. The Chair asked Dean MSS to audit the programme in Spring 2018.

Decision 3004

149. Revised curriculum and roadmap of BS(SCM) at the PNSLM, placed at Appendage 3004 (page 146), approved for adoption wef next batches, with the final semester course 'Logistics and Secretariat Management' replaced by 'Research Project'. The programme shall be audited in Spring 2018.

Action Required	Action by	Responsibility of
Implementation of the Decision (revised curriculum/roadmap)	CO PNSLM	CO PNSLM
Implementation of the Decision (audit)	Dean MSS	Dean MSS
Statutory Documents affected: Roadmap, Curriculum		

Item 3005: BSS Programme - Inclusion of Modern Languages as Electives

Sponsor: HOD(HSS)BUIC

Referral Authority: FBOS M&SS

150. Point withdrawn by the Sponsor, on 20th Sep.

Item 3006: BS Psychology – Addition of Electives “Forensic Psychology” and “Health Psychology”

Sponsor: Dir IPP

Referral Authority: FBOS PP

Summary of the Case

151. Two electives – "Forensic Psychology" and "Health Psychology" – were proposed to be added to the curriculum of the BS Psychology programme, running at BUIC and BUKC. The courses were purported to give the students more options, and bring improvements in the programme. Outlines of the two courses are placed at Appendage 3006 (page 167).

Discussion

152. Dean PP reviewed the background of the case, adding that the two electives were also in the HEC's approved list. The additional electives were approved and the point dropped.

Decision 3006

153. Electives "Forensic Psychology and Heath Psychology", with outlines at Appendage 3006 (page 167), approved for inclusion in BS Psychology curriculum. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs PP	Dean PP
Statutory Documents affected:	Roadmap, Curriculum	

Item 3007: BS CS & BS IT – Addition of 3 Electives

Sponsor: HOD CS BUKC

Referral Authority: FBOS EES

Summary of the Case

154. Following 3 Electives were proposed to be added to the roadmaps of BS CS and BS IT, considering technology demands and results of the market survey:

- a. Big Data Analytics.
- b. Introduction to Data Science
- c. Ubiquitous Computing

155. Course outlines are attached as Appendage 3007 (page 169).

Discussion

156. Dean ES underscored the importance of these electives for the BS CS and BS IT programmes; the Council approved the electives.

Decision 3007

157. Electives referred to at para 154, with outlines at Appendage 3007 (page 169) approved for addition to the BS (CS) and BS (IT) curricula. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs CS	Dean ES
Statutory Documents affected:	Roadmaps, Curricula	

Item 3008: BEE Programme – Revision of Roadmap for Power Systems Stream

Sponsor: HOD EE BUKC

Referral Authority: FBOS EES

Summary of the Case

158. BUKC had applied to PEC for Change of Scope to allow increase in by 40 and to allow the “Power Systems” stream in the BEE program. A PEC team, during the Change of Scope visit, recommended few changes in the existing BEE roadmap of Bahria University to cater to the Power Systems Specialization. The roadmap had accordingly been revised with the “Power Systems” stream added, and with additional courses for the Power System stream (only) with no changes for other streams. The revised roadmap, placed at Appendix 3008 (page 176), was tabled for approval.

Discussion

159. Dean MSS and HOD EE BUKC reiterated the case which was approved and the point dropped.

Decision 3008

160. Addition of the ‘Power System Stream’ to the BEE roadmap, and addition of courses to the existing roadmap for the Power Systems Stream only, as highlighted at Appendix 3008 (page 176) approved, wef the **Fall 2017** intake” for BUKC. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs EE	Dean ES
Statutory Documents affected:	Roadmaps, Curricula	

Item 3009: BSE Programme – Addition of the Domain “Data Science” and the Elective “Introduction to Data Science” to the new Domain

Sponsor: HOD CSE BUKC

Referral Authority: FBOS EES

Summary of the Case

161. The case, taking due cognizance of the emerging software exploration field of “Data Science”, proposed:

- a. addition of the electives domain “Data Science” to the BSE roadmap; and
- b. addition of the Elective “Introduction to Data Science (CSC-487)” to the new domain, to join three other in the same domain: Big Data Analytics (SEN 332), Data Mining (CSC-452) and Data Warehousing (CSC-454).

162. Working Paper is placed at Appendix 3009 (page 186).

Discussion

163. Dean ES and HOD CSE BUKC reiterated the case which was approved.

Decision 3009

164. Addition of the domain “Data Science” to the BSE roadmap, and addition of the elective “Introduction of Data Science” to the new domain, approved wef the Fall 2018 intakes. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs SE & CSE	Dean ES
Statutory Documents affected:	Roadmap, Curriculum	

Item 3010: BS Geology, BS Geophysics and BS Environmental Sciences – Changes to Roadmaps

Sponsor: HOD EES BUIC

Referral Authority: FBOS EES

Summary of the Case

165. After omni-consultation, EES Dept BUIC had revised the roadmaps of BS Geology, BS Geophysics and BS Environmental Sciences which were tabled for approval. Working paper, changes made to the roadmaps and the revised roadmaps are placed at Appendage 3010 (page 187).

Discussion

166. HOD EES BUIC explained the changes which he said were in the latter semesters and could, therefore, be made effective from Fall 2017 intakes; the Council agreed; presentation transcript is placed at the end of Appendage 3010. DE underscored the importance of indicating Course Codes and courses Credit Hours when tabling new courses, curricula, roadmaps, outlines or programmes. With that, the case was approved.

Decision 3010

167. Changes to roadmaps of BS Geology, BS Geophysics and BS Environmental Sciences, as enunciated at Appendage 3010 (page 187), approved wef the Fall 2017 intakes. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs EES	Dean ES
Statutory Documents affected:	Roadmaps, Curricula	

Secretary's Note

168. DE's observation, important as it was, is recorded as an autonomous Decision 3041, for ease of future reference, and placed in its logical sequence.

Item 3011: LLM Programme – Addition of Electives

Sponsor: HOD(Law)IC

Referral Authority: FBOS MSS

Summary of the Case

169. The case proposed addition of the following 14 Electives to the LLM programme:

	<u>Code</u>	<u>Title</u>
1	LLM-726	Cyber Space Law: Internet Jurisdiction and Dispute Resolution
2	LLM-727	Cybercrime: Int Cooperation and Digital Investigations
3	LLM-728	E-Commerce Laws
4	LLM-729	Media Laws
5	LLM-730	Global Security & Human Rights Law
6	LLM-731	International Refugee Law
7	LLM-732	International Investment Law
8	LLM-733	Comparative Criminal Justice
9	LLM-734	International Humanitarian Law
10	LLM-735	Immigration Law
11	LLM-736	Law of Treatise
12	LLM-737	Islamic Law of War and Peace
13	LLM-738	International Criminal Law
14	LLM-739	Energy And Climate Change Law

170. Courses details are placed at Appendage 3011 (page 196).

Discussion

171. HOD Law BUIC presented the case. After a brief discussion, the Council approved addition of the Electives in question.

Decision 3011

172. The 14 LLM Electives, listed at para 169 and described in Appendage 3011 (page 196), approved for addition to the LLM roadmap. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD(Law)IC	HOD(Law)IC
Statutory Documents affected: Course Code Handbook, LLM Roadmap, LLM Prospectus, LLM Study Guide (if any)		

Item 3012: MBA3.5 Evening at BULC – Proposal to shift to Weekend format

Sponsor: HOD(MS)LC

Referral Authority: File No. BULC/MS/2017/305

Summary of the Case

173. BULC had requested the 27th ACM (Oct 2016) to shift MBA3.5 from the morning to the evening format, to help on-the-job students join the programme. The request was approved vide Decision 2727. The move did not work and the programme could not attract any students. The Campus, after consultation with the banking sector, then asked for shifting the programme to the weekend format. The case was processed on file and approved. The file decision was tabled for ratification. Working paper is placed at Appendage 3012 (page 210).

Discussion

174. The Council found merit in the proposal and approved it.

Decision 3012

175. MBA 3.5 at BULC approved to be shifted from the 'Evening' to the 'Weekend' format. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DLC	DLC
Statutory Documents affected:	-	

Item 3013: MBA Technology Management at BUKC – Launch Proposal

Sponsor: HOD(MS)KC

Referral Authority: FBOS M&SS

Summary of the Case

176. The programme was tabled at the 28th ACM (Apr 2017) as one of the three hybrid programmes whence the discussion focused on the very genesis of the programme. Since the proposal had raised more questions than offered answers, and was deficient in documentation, it was pended to be presented to the next ACM with clarity, all aspects looked into and complete documentation (AC Decision 2819 refers). The programme was re-tabled at this ACM, based on the following rationale:

- a. A large number of Engineering and Computing Sciences graduates aspiring to obtain management education, to help them qualify for management jobs.
- b. No university in Karachi offering the said programme.
- c. The programme to add diversity to the portfolio of MBA programmes.
- d. The programme to help graduated step into high-level position in technology companies.
- e. The programme endorsed by the CAC.

177. The programme was envisaged to be launched as a morning programme initially, to be followed by the evening and weekend formats. Working paper and the associated documents are placed at Appendage 3013 (page 211).

Discussion

178. The Sponsor reiterated the case to which the Council agreed. The discussion turned to the 'exclusive MBA degree' vs 'MBA major' debate and whether HEC's NOC was required if it was to be offered as an exclusive degree. The Sponsor reiterated, and it was agreed, that only an exclusive degree, and not a major, would serve the purpose. It was, therefore, approved as such, as an evening/ weekend programme on the trimester format, wef Fall 2017. After the meeting, however, Dean MSS was asked to approach HEC, on the possible requirement of an NOC, from where it was learnt that an NOC was indeed required. Upon this, the programme was pended for the time being.

Decision 3013

179. 'MBA Technology Management' at BUKC pended for the time being.

Item 3014: LLM in International and Maritime Laws - Launch Proposal

Sponsor: HOD(Law)IC

Referral Authority: FBOS MSS

Summary of the Case

180. After success with LLB, LLM (General) and diploma programmes, the case tabled LLM in International and Maritime Laws, based on the rationale that:

- a. international trade in the region to enrich with the materialization of the CPEC projects and Gwadar Port, which would need availability of maritime and international legal expertise;
- b. programme would serve the interests of Pak Navy;
- c. no other Pakistani institution offering the programme; and
- d. programme supported by legal experts and BU management.

181. Case working paper and associated documents are placed at Appendage 3014 (page 230).

Discussion

182. The sponsor reiterated the case which was approved by the Council. Transcript of her presentation is placed at the end of Appendage 3014. The discussion turned to the requirement of NOCs from HEC and PBC. It was decided to seek NOCs from both.

Decision 3014

183. LLM in International and Maritime Laws, as per roadmap at Appendage 3014 (page 230), approved for launch at BUIC wef Fall 2018, subject to NOCs from HEC and PBC. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	-	

Item 3015: MS Law and Business Studies – Launch Proposal

Sponsor: HOD(Law)IC

Referral Authority: FBOS MSS

184. Item withdrawn by the Sponsor, on 20th Sep.

Item 3016: Diploma Program in Intellectual Property Laws (Weekend/Evening) at BUIC – Launch Proposal

Sponsor: HOD(Law)IC

Referral Authority: FBOS MSS

Summary of the Case

185. The case tabled the subject programme with the following rationale that Intellectual Property Law/Rights were becoming an important legal field and an associated academic programme had been

long overdue to meet its requirements. At the FBOS, the discussion had revolved on the programme format – a diploma programme vs a certificate course - the programme duration and content being too short for a diploma but the title ‘diploma’ appearing more appealing than ‘certificate’. After more discussion between the HOD and the Dean, a diploma programme was agreed to, to be run by the existing PFMs and subject experts from the industry. Case working paper and associated documents are placed at Appendage 3016 (page 257).

Discussion

186. The sponsor presented and reiterated the case; presentation transcript is placed at the end of Appendage 3016. However, the Council observed that there was lack of clarity on programme credit hours and hence duration, and nature of the testimonial to be awarded. The case was pended and the sponsor asked to re-present it to the Council with clarity on the points indicated.

Decision 3016

187. Case pended, to be re-presented to the Council with clarity on programme credit hours, duration and the testimonial to be awarded.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD Law BUIC	Dean MSS
Statutory Documents affected:	-	

Item 3017: MS Economics at BUIC – Launch Proposal

Item 3018: PhD Economics at BUIC – Launch Proposal

Sponsor: HOD(MS)BUIC

Referral Authority: FBOS MSS

Summary of the Case

188. These PG programmes in Economics were tabled before the Council, based on the grounds:
- The University’s Strategic Plan sought diversity through new MS and PhD programmes.
 - Competitive market too dictated diversity in the University’s PG programs.
 - With BS Economics already to a good start, MS Economics and PhD would be natural progressions, charting a clear academic path for the students to pursue higher education in such a vital field.
 - The MS programme would help students think logically and improve their ability to use Economic & Fiscal concepts when analysing “real world” Economic & Fiscal problems & opportunities, both in the public and private sectors, through Qualitative & Quantitative methods.
 - After BS and MS programmes in Economics, the PhD programme was a matter of starting sooner rather than later.
 - Many local universities - QAU, IIU, NUML, NUST, QAU, PIDE, NUML, UAAR and COMSATS - were offering either or both programmes.
 - A large PhD faculty in Economics available at the BU.

189. Case working paper, the new programme proposal form and the associated documents are placed at Appendage 3017 (page 265).

Discussion

190. These two items were taken up together owing to their similarities. HOD MS BUIC presented the two programmes; presentation transcripts are at the end of Appendages 3017 & 3018. The Council saw the programmes as natural progressions to the ongoing BS programme in Economics. There was some discussion on the duration of MS programme – 1.5 or 2.0 yrs. Dean MSS opined that 1.5-yr MS programme applied to the Management Sciences discipline only. HOD MS BUIC cited the MS Economics programmes at the NUST and LUMS that were of 1.5-yr duration. The Chair viewed that the 1.5 yr option would be more attractive. Duration of MS programme notwithstanding, which would automatically crystallise in HEC's NOC, both programmes were approved for launch at the BUIC, wef Fall 2018, subject to NOCs from the HEC.

Decision 3017

191. MS Economics, as per roadmap at Appendix 3017 (page 265), approved for launch at BUIC wef Fall 2018, subject to NOC from the HEC. Progress to be reported.

Decision 3018

192. PhD Economics, as per roadmap at Appendix 3018 (page 301), approved for launch at BUIC wef Fall 2018, subject to NOC from the HEC. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	-	

Item 3019: BSS (Development Studies) & BSS (IR) at BUKC – Launch Proposal

Sponsor: HOD(HNS)BUKC

Referral Authority: FBOS M&SS

193. Item withdrawn by the Sponsor on 28th Sep.

Item 3020: BS English at BUKC - Launch Proposal

Sponsor: HOD(HNS)BUKC

Referral Authority: FBOS M&SS

Summary of the Case

194. The case proposed launching of a BS programme in English, in the linguistics and literature domains, that would also open more avenues for the large number English faculty at the BUKC. Working paper and associated documents are placed at Appendix 3020 (page 345).

Discussion

195. The Council found merit and viability in the proposal and approved it, wef Spring 2018.

Decision 3020

196. BS English, in the Linguistics and Literature domains, as per roadmap at Appendage 3020 (page 345), approved for launch at BUKC wef Spring 2018. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD HSS BUKC	DKC
Statutory Documents affected:	Roadmap, Curriculum	

Secretary's Note

197. In view of Decision 3033, the sponsor of this item is changed to "HOD HSS BUKC".

Item 3021: MS Data Science – Launch Proposal	
Sponsor: HOD(CS)BUIC	Referral Authority: FBOS EES

Summary of the Case

198. The case tabled the subject programme with the following rationale:
- Growing demand for Data Scientists who could apply powerful tools, and advanced statistical modeling techniques, to make discoveries about business problems, processes and platforms.
 - Programme to equip Data Scientists with the required tools and techniques.
 - MS Data Science to integrate Technologies, Analytics and Business Needs.
199. Working paper and associated documents are placed at Appendage 3021 (page 360).

Discussion

200. HOD CS BUIC presented and reiterated the case; transcript of the presentation is placed at the end of Appendage 3021. The Council found the programme pertinent and viable, and approved it. The Council agreed to DPGP's suggestion to reduce the programme credit hrs to 30, from 33, as required by the HEC. HOD CS BUKC made a case for launching the same programme at BUKC which was accepted.

Decision 3021

201. MS Data Science, as per roadmap at Appendage 3021 (page 360) with credit hours reduced to 30, approved for launch at BUIC and BUKC, wef Fall 2018, subject to NOC from the HEC. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	Roadmap, Curriculum	

Item 3022: Master in Public Health (MPH) – Launch Proposal

Sponsor: HoD CHS BUMDC

Referral Authority: FBOS HS

202. Item withdrawn by the Sponsor, on 27th Sep.

Item 3023: BSc(Hons) in Allied Health Sciences for Medical & Dental Technicians – Launch Proposal

Sponsor: HoD MDRL,BUMDC

Referral Authority: FBOS HS

Summary of the Case

203. The 28th ACM had been presented with a list of 17 courses for medical technicians upon which BUMDC was asked to shortlist and present 3-4 doable programmes with complete documentation. Accordingly, at this ACM, BUMDC tabled BSc(Hons) in Allied Health Sciences for Medical & Dental Laboratory Technicians. PMDC also recommended to start these programs within 10 years of establishing a medical/dental college. Working paper is placed at Appendage 3023 (page 387).

Discussion

204. HOD(MDRL) and Ag Principal Dental Section made presentations for the respective programmes; transcripts are placed at the end of Appendage 3023. Contrary to the documents at Appendage 3023, the presentations proposed BS Allied Health Sciences (Medical Lab Technology) for medical technicians and Associate Degree of Dental Surgery Assistant for dental technicians.

205. Despite the change of title, case for medical technicians was clear and was approved. For the dental technicians, however, the nature of testimonial, after the 2-year program, came under discussion. Diploma, which the Sindh Text Board and other institutions in Karachi offered was ruled out as the proposed programme required a minimum qualification of HSSC as opposed to SSC for the diploma. BSc was also ruled out in light of the HEC directive to discontinue BA, BSc, MA and MSc degrees. That left the Associate Degree. There was a suggestion for ‘Associate of Science’ in Dental Surgery on the lines of ‘Fellow of Science’, ‘Bachelor of Science’ and ‘Master of Science’ degrees. With the discussion deadlocked, the proposal was pended. It was also agreed to split the proposal into two different programmes, due to differences in the two degrees and their titles.

Decision 3023

206. a. ‘BS Medical Laboratory Technology’ approved for launch at BUMDC, iaw the documentation placed at Appendage 3023 (page 387), wef Spring 2018. Progress to be reported.

b. Item 3023 retitled as “BS Medical Laboratory Technology”

c. Case for dental technicians pended, to be re-presented at the next ACM, with clarity on the exact title of the degree. “Item 3042: Associate Degree in Allied Health Sciences for Dental Technicians”.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD(MDRL)BUMDC	Principal BUMDC
Statutory Documents affected: Roadmap, Curriculum		

Item 3024: BS Economics at BUKC – Launch Proposal

Sponsor: HoD MS BUKC

Referral Authority: FBOS M&SS

Summary of the Case

207. The case proposed launch of BS Economics at BUKC on the lines of the same programme at BUIC. Working paper is placed at Appendage 3024 (page 434).

Discussion

208. The Council found the proposal deficient in documentation. Further, the Council considered stabilisation of the newly formed Dept of HSS at BUKC before burdening it with another programme after BS English. The case was, therefore, pended.

Decision 3024

209. ‘BS Economics’ at BUKC pended for the time being.

Item 3025: LLB at BUKC – Launch Proposal

Sponsor: Dean M&SS

Referral Authority: FBOS M&SS

Summary of the Case

210. The case proposed launch of LLB at BUKC on the lines of the same programme at BUIC. The 22nd ACM (Apr 2014) had already approved the programme at BUKC with the provisos that:

- a. Professionals be engaged to run the programme.
- b. There should be no space conflict.
- c. A Steering Committee under HOD(Law)IC, with HOD(Law)LC and DKC as members to oversee the programme.

211. The Academic Council directive could not, however, materialize due to PBC’s negative intervention resulting in closure of programme at the BULC and the LLB programme at BUIC put on notice. With the situation thence improved, BUKC, vide this case, sought approval to start working on the programme. Working paper is placed at Appendage 3025 (page 440).

Discussion

212. The Council found the proposal deficient in documentation. Dean MSS opined that a separate dept would be required to run the programme. The Chair formed a steering committee under the Dean MSS to carry out a feasibility study for establishing a law department at the BUKC, with a 2-month deadline to present its report.

Decision 3025

213. A steering committee of Dean MSS (Committee Chair), DKC, HOD Law IC and Legal Advisor BUKC to carry out feasibility study for establishing Law Department at the BUKC and present its report in two months.

Action Required	Action by	Responsibility of
Implementation of the Decision	Committee	Dean MSS
Statutory Documents affected: -		

Item 3026: PhD in International Relations - Launch Proposal

Sponsor: HOD(HSS)BUIC

Referral Authority: FBOS MSS

Summary of the Case

214. The case proposed launch of a PhD programme in International Relations, on the grounds that:

- a. Social Sciences had emerged as a marketable field and a PhD degree would be a feasible option for the BU;
- b. local universities QAU, IIU and NUML were already offering this programme; and
- c. owing to strategic location and name, BU would provide the students with an alternative option.

215. Like any PhD programme, the primary focus of PhD IR would be on quality research. Case working paper, the new programme proposal form and the associated documents are placed at Appendage 3026 (page 452).

Discussion

216. HOD HSS BUIC emphasised that a higher degree acted as an incentive to students of lower degree who saw it as a pathway for continuation and progression. The Council found merit and viability in the programme and approved it for launch wef Fall 2018, subject to HEC's approval.

Decision 3026

217. PhD IR, as per roadmap at Appendage 3026 (page 452), approved for launch at BUIC wef Fall 2018, subject to NOC from the HEC. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	Registrar
Statutory Documents affected:	-	

Item 3027: Course Withdrawal Rule – Change of Withdrawal Option Period to up to Week-13 from the Current Week-7

Sponsor: HOD(MS)BUKC

Referral Authority: FBOS MSS

Summary of the Case

218. According to BU Academic Rule 3.12.3, a student was not allowed to withdraw from a course after week-7 weeks, that is, after a week before the mid-term exam. As such, a student unable to obtain a satisfactory score in the mid-term exam, was compelled to continue with the semester. The case considered this unjustified and proposed course withdrawal up to week-13. It was envisaged that the provision to withdraw a course in up to week-13 would facilitate the students make a better decision on their academic planning, and help reduce the drop rate. The proposal found favour with the FBOS and was tabled for consideration of the Academic Council. Working paper is attached as Appendage 3027 (page 458).

Previous Deliberations on the Case

219. Prior to 2011, 'Withdrawal' could be exercised in up to 2 weeks before the Final Exam. The 7-week policy was promulgated by QA on 16th Sep 2011, and later enacted as an Academic Rule. The 17th ACM (Dec 2011) deliberated the issue whereupon the Council was informed that the duration was shortened to up to week-7 to 'discourage casual behavior' on part of the students who would register a course in the beginning of the semester, only to withdraw at the last moment to avoid "F" grade, if anticipating a failure. The Council had decided to continue with the 7th week rule and review if after three years, if required.

Discussion

220. HOD MS BUKC reiterated the proposal. Dean ES disagreed and pointed to the HEC's new Academic Rules (adopted by BU vide Item 2901) that mandated a duration, similar to BU's, for withdrawing from a course. All other speakers - DLC, HOD (CS&IT) BULC and HOD MS BUIC - opposed the suggestion and asked for status quo to be maintained. Upon which the Council ruled for status quo to be maintained.

Decision 3027

221. The proposal to extend the course withdrawal duration period to up to week-13, from the current week-7, not approved. Status quo to be maintained. Point dropped.

Item 3028: Final Exam Result – Extension of Submission Period to 7 Days from the Current 3 Days
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Sponsor: HOD(MS)BUKC

Referral Authority: FBOS MSS

Summary of the Case

222. According to the existing Examination Policy, a faculty member was required to submit the Final Exam result within 3 days after conduct of the examination, to meet the online result declaration date. The case considered this unrealistic, as many faculty members continued to remain busy with invigilation duties until the last exam day. Besides, the pressure to submit in 3 days had led to errors, which did not augur well. The case proposed extension of submission period to 7 days or the calculation of submission period at an assessment rate of 20 copies per day. The case further argued that with the new system requiring the faculty members to enter the result into the system, the load of the IT department had reduced drastically; this would save in the result punching time, allowing the online result declaration date to still be met despite increase in the submission time. Working paper is placed at Appendix 3028 (page 459).

Discussion

223. DE pointed out that the current deadline was 5 days, and not 3 days as carried in the proposal. DLC considered the current submission period adequate. The discussion then turned forwards to use of IT in expediting result submission. DDIT stated that migration module was already in place to transfer the examination result data expeditiously. D Acad opined that the issue was not of IT but of sheer volume of assessment work. The Chair appointed a committee comprising DE (Committee Head), Dean ES and DDIT, to find an IT solution to reduce the time involved in submission of results. The proposal to extend the submission period to 7 days was, however, not approved.

Decision 3028

224. a. Proposal to extend submission period of Final Exam results to seven days not approved. Status quo be maintained. Point dropped.

- b. A committee of DE (Committee President), Dean ES and DDIS, to find an IT-based solution to reduce submission time of Final Exam results.

Action Required	Action by	Responsibility of
Implementation of the Decision	Committee	DE
Statutory Documents affected:	-	

Secretary's Note

225. In view of Decision 3028, the Item is retitled as "IT-based Solution to reduce Submission Time of Final Examination Results."

Item 3029: MBA 1.5 – Expansion of Eligibility Scope

Sponsor: HOD(MS)BUKC

Referral Authority: FBOS MSS

Summary of the Case

226. The case proposed expansion of eligibility scope into BU's MBA1.5 programme, to include ACCA, CA, ACMA, BCom (4 Years), MCom and MPA degrees/qualifications, iaw the new HEC rules. Working paper is attached as Appendage 3029 (page 460).

Discussion

227. The Council learned that academic qualification in question were also indicated in HEC's roadmap available on their website (HEC roadmap added to Appendage 3029). HOD MS BUIC feared that expansion of the eligibility scope might affect MBA2.0 to which HOD MS BUKC responded that that would not be the case because there were no students with the said educational backgrounds in BU's MBA 2.0 programmes. Dean MSS informed the Council that HEC had declared ACCA equivalent to 16 years education. The Council approved the proposal, wef Spring 2018 inductions.

Decision 3029

228. Candidates with ACCA, CA, ACMA, BCom(4 years), MCom and MPA qualifications shall be eligible for induction in MBA1.5 programmes at BU, wef Spring 2018 inductions. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision (BUHO level)	DA	DA
Implementation of the Decision (CU level)	HODs MS	CU Directors
Statutory Documents affected:	Admission Policy, Roadmap	

Item 3030: BS Thesis – Extension of Submission Timeframe *a la* MS Programmes

Sponsor: HOD EES BUIC

Referral Authority: FBOS EES

Summary of the Case

229. According to BUAR 3.9, Projects, Dissertations and Theses were to be registered in the second last semester, with the various target dates set by the respective departments. The case proposed extension of target dates *iaw* the MS thesis timeframe, which the HERC had recently enacted. The case was based on the premise that BS Theses in the Department of Earth & Environmental Sciences were dependent on data from the Directorate General of Petroleum Concession, Pakistan (DGPC) which came late thereby leaving little time for the students to work on the theses and submit them on time. Working paper is attached as Appendix 3030 (page 462).

Discussion

230. HOD EES BUIC presented and reiterated the case; presentation transcript is placed at the end of Appendix 3030. He added that the BS students' strength had doubled in the last few years resulting in doubling of the theses load. Besides, BS EES theses differed in that they depended on data not only from the DGPC but also students' own field work which then had to be sent to outside agencies. He further dilated that the theses were roadmapped in the 8th semester and could not be started earlier due to pre-requisites. Other speakers, however, opined that a BS theses could not be equated to MS thesis for which the extended timeline was offered as an incentive to research vs course work, and that it had implication for other BS programmes. Upon this, the Council decided to maintain status quo.

Decision 3030

231. The proposal to extend the timeline of BS theses in EES Dept *a la* MS theses not approved. Status quo be maintained. Point dropped.

Item 3031: Amendments to 'BU Academic Regulations' and 'BU Academic Rules' in the light of HERC Decisions

Sponsor: D Acad

Referral Authority: D Acad

Summary of the Case

232. In the last meeting of the HERC, MS/Phil Rules had been approved which necessitated minor amendments to the following clauses of the academic statutes:

- a. BU Academic Regulation clause 2.2.2.c.
- b. BU Academic Rule clause 2.2.1.
- c. BU Academic Rule clause 2.2.4

233. These changes are explained at Appendix 3031 (page 463) and were tabled for approval.

Discussion

234. D Acad briefed on the three amendments that the Council considered pertinent and accorded approval. Presentation slide is added to Appendix 3031.

Decision 3031

235. Amendments to BU Academic Regulations and BU Academic Rules, as enunciated at Appendage 3031 (page 463) approved. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DAcad	DAcad
Statutory Documents affected:	Academic Regulations, Academic Rules	

Item 3032: MBBS/BDS Professional Exams – Common or Separate Exams for FMDC & BUMDC

Sponsor: Dean Health Sciences

Referral Authority: FBOS HS

Summary of the Case

236. The case highlighted the issue of common question papers for the Annual and Supplementary examinations at the BUMDC and FMDC, the college affiliated, due to:

- a. different teaching methodologies – BUMDC on the Hybrid Modular System and the FMDC on the Annual System – despite both colleges following the same and same and ACM-approved Curricula and TOS; and
- b. different weightage of internal assessment in the Professional Exams - 20% in Hybrid system and 10% in the Annual - to which both the BUMDC and FMDC agreed.

237. To address the issue, the case tabled two options for consideration and approval:

- a. The annual and supplementary examination papers be common for both colleges, with BUMDC weighting it down to 80% and FMDC to 90%; or
- b. Separate examination papers be made for each subject for either college.

238. Working paper is placed at Appendage 3032 (page 464).

Discussion

239. DE informed the Council that option 'a' had already been approved on file. DHS supported option 'b' on the grounds that standard of question papers had to be lowered to cater to FMDC standards. DE stated that standards were not being lowered and that no concession was being given to FMDC. He added that 20% questions, which were conceived to be easy, had already been deleted. With that option 'a' was approved.

Decision 3032

240. Question papers for MBBS and BDS Annual and Supplementary Examinations at BUMDC and FMDC shall continue to be common. BUMDC shall give 80% weightage and FMDC 90% weightage to these papers, leaving the balance weightage for internal assessment. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principals BUMDC & FMDC	DE
Statutory Documents affected:	Examination Rules	

Item 3033: Humanities & Natural Sciences Department at BUKC – Conversion to Humanities & Social Sciences Department

Sponsor: HOD(H&NS)BUKC

Referral Authority: FBOS M&SS

Summary of the Case

241. The case proposed converting, or renaming, the Department of Humanities and Natural Sciences (HNS) to the Department of Humanities and Social Sciences, to enable it launch programmes in Social Sciences, as at BUIC. The proposal would expand the role of HNS Dept from overseeing the common courses of all the departments to running own programmes. Working paper is placed at Appendix 3033 (page 465).

Discussion

242. The Council found the proposal pertinent and in line with the needs of the time, and approved it.

Decision 3033

243. The ‘Humanities & Natural Sciences’ Dept at BUKC renamed as ‘Humanities & Social Sciences’ Dept. Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision (BUHO level)	Registrar	Registrar
Implementation of the Decision (CU level)	HOD HNS BUKC	DKC
Statutory Documents affected: BU Statutes		

Item 3034: MBBS, BDS & DPT Programs – Student Study Guides

Sponsor: Dean HS

Referral Authority: FBOS HS

244. Item withdrawn by the Sponsor, on 22nd Sep.

Item 3035: LLB Programme – Draft Rules for Final Year Research Project (FYSP)

Sponsor: HOD(Law)IC

Referral Authority: FBOS MSS

Summary of the Case

245. Item withdrawn by the Sponsor, on 28th Sep.

Item 3036: Departmental Contingency Budget for Official Activities by Students

Sponsor: HOD CE BUIC

Referral Authority: FBOS EES

Summary of the Case

246. The case proposed placing a sum of Rs 200,000 annually at the disposal of the HOD to meet various contingency requirements in respect of students, such as outstation travel at short notice to

participate in academic/sports events, payment of registration fees for various events, etc. The case considered filework seeking financial approval, and ensuing delays, as a disincentive to students to participate in such events which were considered important for their grooming and the University's projection. There would be a proper mechanism to manage, monitor, account for and report on the utilization of these funds. Working paper on the proposal is placed at Appendage 3036 (page 466).

Discussion

247. DF considered the item a non-issue as the HODs could always draw 'advance' to be adjusted belatedly. He also emphasized that BU Ord or Statues granted no such financial powers to HOD. The proposal did not draw any support and was, therefore declined.

Decision 3036

248. The proposal to sanction Department Contingency Budget for official Activities by the students, not approved. Point dropped.

Item 3037: Final Transcript - Removal of all References to 'F' Grades & Repeated Courses

Sponsor: DAcad

Referral Authority: VLC on 14th Sep

Summary of the Case

249. At the VLC of 14 Sep, referred also in Item 2901, a proposal was tabled to delete all negative references from the student's Final Transcript, that is, Mentions of 'F' Grade and Repeat courses. This was to safeguard the job prospects of the BU graduates, and to ensure that they were not harmed doubly having already suffered through late graduation and payment of additional fees. Upon which, DAcad, DE and Dean ES were asked to deliberate on the issue.

250. The Committee's deliberations are summarised at Appendage 3037 (page 467). The Committee's conclusion was that 'To Show' or 'Hide' was a psychological issue. 'F' Grade or Repeat annotation was looked at in the context of other grades, the CGPA and the duration during which the programme was completed. As such 'Hiding' did not improve job prospects; rather it could have negative implications for the applicant and the university. The Committee recommended that BU might continue with its current result transcription practices.

Discussion

251. D Acad presented the Committee's report dwelling on two cases (added to Appendage 3037), and concluded that hiding negative references from transcript did not improve job prospects since the recruiters always saw low grades in the context of other grades, programme durations and the CGPA. On the contrary hiding negative references could have negative impact on the applicant and his/her alma mater. He then presented the Committee's recommendation to continue with the practice in vogue. HOD MS BUKC and HOD PP BUIC reiterated the case for removal of negative references. All other speakers – DLC, HODS (CS&IT) and MS from BULC - agreed with the Committee's recommendation. Winding up the discussion, the Chair ruled in favour of maintaining status quo.

Decision

252. The proposal to remove references to 'F' grade and Repeated courses from the final transcript, not approved. Status quo be maintained. Point dropped.

Item 3038: MSPM at BULC – Regularisation of Admissions made at below the Eligibility CGPA

Sponsor: DA

Referral Authority: Decision on file BU/AD/76-F17/PC-II

Summary of the Case

253. Between Fall 2013 and Fall 2015, both inclusive, 19 students joining MSPM programme at the BULC had less than 2.5 eligibility CGPA (from the previous degree). This was picked up in the Campus's mock audit of the programme in Jul. As per rules, HEC had set no CGPA minima requirement for admissions into MS programmes though BU had set and enacted it at 2.5. The case proposed regularization of these 19 admissions to prevent any observations from HEC. Working paper on the case is placed at Appendage 3037 (page 467).

Discussion

254. The Council unanimously agreed to regularising the admission in question with previous degree CGPA less the 2.5 but more than 2.0.

Decision

255. Admission for the nineteen students listed at Appendage 3038 (page), who were admitted to MSPM program at BULC between Fall 2013 and Fall 2015, regularized. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DLC	DA
Statutory Documents affected:	Students' Files	

Item 3039: SOP for Students' Exchange with Yeditepe University, Turkey

Sponsor: IO

Referral Authority: Decision on file

Summary of the Case

256. The case tabled draft SOP for students' exchange programme with the Yeditepe University of Turkey. Working paper is placed at Appendage 3039 (page 472).

Discussion

257. Since the SOPs were identical to the ones approved by the Council previously, the Council approved them without much discussion.

Decision

258. SOP for Students' Exchange with the Yeditepe University of Turkey as placed at Appendage 3039 (page 472) approved. Point dropped.

Action Required	Action by	Responsibility of

Implementation of the Decision	IO	IO
Statutory Documents affected: SOPs for Students' Exchange with the Yeditepe University		

Item 3040: Unified Course Codes for Theses in PG Programmes

Sponsor: DPGP

Referral Authority: HERC

Summary of the Case

259. In its last meeting, the HERC had approved Uniformed Course Codes for Theses in the PG programmes, and the minimum number of Semesters and Credit Hours to register theses, as follows:

Program	Course Code for Thesis	Credit Hours (CR)	Min Number of Semesters & Credit Hours Required to Register Thesis
PhD	THS-900	36	4 semesters, 9 CR each
MS2.0/MPhil	THS-701	6	2 semesters, 3 CR each
MS1.5	THS-702	6	6 in one semester

260. Since the case involved changes to Course Codes and Roadmaps (distributing the theses over multiple semesters, except in the case of MS1.5), the HERC decision was tabled for ratification by the Council. Case working paper is placed at Appendix 3040 (next page).

Discussion

261. The Council unanimously ratified the proposal. The Council also agreed to HOD MS BUIC's suggestion to apply the new rules on MPhil Management Sciences wef Spring 2017 intakes (who were in the 2nd semester in Fall 2017) to help these students spread the thesis over two semesters.

Decision 3040

262. Uniform course codes for PhD, MS2.0/MPhil and MS1.5 theses, their credit hours and minimum number of semesters and credit hours per semester to register the theses as enunciated at para 259, ratified. For MPhil Management Sciences programmes, these rules shall apply with effect from Spring 2017 intakes. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DPGP	DE
Statutory Documents affected: Course Code Handbook		

Decision 3041 (see para 168)

263. Course Codes and courses Credit Hours shall be indicated with course titles when tabling new courses, curricula, roadmaps or outlines for any academic programme. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	HODs	Deans
Statutory Documents affected: Course Code Handbook		

Item 3042: Associate Degree in Allied Health Sciences for Dental Technicians

Sponsor: VP Dental Section

Referral Authority: AC

Summary of the Case

264. See para 203.

Discussion

265. See paras 204 & 205.

Decision 3042 (see Decision 3023)

266. Case for dental technicians pended, to be re-presented at the next ACM, with clarity on the exact title of the degree.

Action Required	Action by	Responsibility of
Implementation of the Decision	VP Dental Section	DG BUMDC
Statutory Documents affected: -		

Any Other Points

267. DG BUKC requested permission to move Item 3002 on file as opposed to re-presentation at the next ACM to save on time, which was approved (*see para 141 and Decision 3002*).

268. DG BUKC commented that whereas the system of processing academic matters through DBOS and FBOS was well entrenched, the management of the CUs was getting by passed in the process, often resulting in a conflicting situation where the management did not agree with the case being initiated from their own CU. To address the issue, Pro-Rector suggested pre-clearance of DBOS points with the CU management while DAcad proposed CU's Deputy Director Academics attending the DBOSs. The Chair asked the Registrar to move the case on file with a solution.

Decision 3043

269. Registrar to move the issue, of keeping the CU management in picture while initiating cases at DBOS, on file with a solution.

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar	Registrar
Statutory Documents affected: -		

270. DG BUKC requested the BUHO for more efforts on clearing BUKC's programmes with the HEC due to geographical proximity; the DG was assured of max efforts in this direction.

271. DLC proposed that BULC's members of the Council attend one ACM per year from Islamabad for reasons of networking.

Closing the Meeting

272. The Secretary drew the attention of the House to the following timeline for follow-up actions and the next ACM:

3rd Jan 2018: 1st Progress Report on the Action Items of the 30th ACM

2nd Mar 2018: - 2nd Progress Report on the Action Items of the 30th ACM
- Agenda Items for the 31st ACM

3rd & 4th Apr 2018: 31st ACM

273. The Chair thanked the house for participation in the proceeding. Wishing them well, the Chair brought the meeting to a close at about 18:30 hrs the same day.

M Ehsan Saeed
Secy to the Council

13th Oct 2017

Appendage 2009**Approval/ endorsement of BUMDC MPhil Programs (Anatomy, Pathology and Pharmacology) Road Maps & Curricula/ Courses****Initiated By: Dean Health Sciences****Background of the Case:**

BUMDC MPhil Programs in the subjects of Anatomy, Pathology and Pharmacology are starting w.e.f Fall 2017. The road maps and curricula/ courses already approved by FBoSoHS and HERC are submitted to have approved by the Academic Council BU.

Financial Effects:

- Teaching expertise is available in BUMDC except for Medical Genetics for which VFM is in process.
- Finances required for taking up phases of MDRL simultaneously.
- Bahria University will receive finances in term of fee from candidates.

Recommendations:

Highly recommended as per the essential need of Bahria University for research and ranking.

Roadmaps for MPhil in Anatomy, Pathology and Pharmacology at BUMDC**1. MPhil ANATOMY**

Course title	MPhil Anatomy
Course duration	2 years (max 3 years)
Study system	Semester System
No. of regular semesters	4
Semester Duration	16 weeks teaching + 2 weeks examination
Total credit hours	30 credit hours (24 credit hr. of course work + 6 credit hours research)
Credit hour distribution	Semester I= 9 Semester II= 9 Semester III=9 Semester IV=3

ROADMAP**SEMESTER 1**

Course Code	Course Title	Credit Hours
MED-701	Research Methodology	3+0
MED-712	Medical Biology & Genetics	2+0
MED-713	Medical Education, Ethics & Writing	2+0
MED-714	Instruments and Animal use in research	1+1

MED-715	Journal Club (Essential)	No credit hour
MED-716	Teaching Internship (Essential)	No credit hour
	Total	09

SEMESTER 2

Course Code	Course Title	Credit Hours
ANA-730	Neuroanatomy with Head & Neck	2+1
ANA-731	GIT with related abnormalities	2+1
	Elective -I	03
MED-715	Journal Club (Essential)	No credit hour
MED-716	Teaching Internship (Essential)	No credit hour
	Total	09

SEMESTER 3

Course Code	Course Title	Credit Hours
	Elective-II	03
	Elective-III	03
THS-701	Thesis	03
MED-715	Journal Club (Essential)	No credit hour
MED-716	Teaching Internship (Essential)	No credit hour
	Total	09

Course Code	Course Title	Credit Hours
THS-701	Thesis	03
	Total	03
	TOTAL CREDIT HOURS	30

CORE COURSES

S. No	Course Code	Course Title	Credit Hours
1	MED-712	Medical Biology & Genetics	02
2	MED-713	Medical Education, Ethics & Writing	02
3	MED-714	Instruments and Animal use in research	02
4	ANA-730	Neuroanatomy with Head & Neck	03
5	ANA-731	Gastrointestinal Tract	03
6	THS-701	Thesis	03
7	THS-701	Thesis	03
8	MED-715	Journal Club (Essential)	No credit hour
9	MED-716	Teaching Internship (Essential)	No credit hour

ELECTIVES

S. No	Course Code	Course Title	Credit Hours
1	MED-706	Tissue processing	03(1+2)
2	MED-708	Cadaveric dissection	03(1+2)
3	MED-709	Advanced microscopic techniques	03(1+2)
4	ANA-732	Microscopic structure of Tissue	03(2+1)
5	ANA-733	Developmental Anatomy	03(2+1)
6	ANA-734	Musculoskeletal system	03(2+1)
7	ANA-735	Cardiovascular & Respiratory system	03(2+1)
8	ANA-736	Urogenital system	03(2+1)
9	ANA-737	Reticuloendothelial system	03(2+1)

UNIVERSITY REQUIREMENT

S. No	Course Code	Course Title	Credit Hours
1	MED-701	Research Methodology	3+0

CORE COURSES DESCRIPTION**MED-701 [3+0 Credit hours]****RESEARCH METHODOLOGY, BIOSTATISTICS, EPIDEMIOLOGY:****Objectives:**

1. Describe research, research methods, research studies, their designs and work feasibility
2. Describe types of data and ways of collection of data
3. Comprehend organization, categorization and analyses of collected data
4. Describe the fundamental concepts and methods of statistics in the areas of medical research
5. Demonstrate use of statistical computer software for data analysis
6. Explain the concepts and methods of epidemiology in the areas of medical research
7. Describe advantages and disadvantages of epidemiological studies

Learning Outcome:

Upon completion of course the students will be able to:

1. Acquire the basic knowledge of research, research studies, their designs and work feasibility
2. Organize, categorize and analyze the collected data
3. Apply fundamental concepts and methods of statistics in the areas of medical and biological research
4. Use of statistical computer software for data analysis
5. Apply fundamental concepts and methods of epidemiology in the areas of medical and biological research
6. Describe advantages and disadvantages of epidemiological studies

Course Outline:

Research and experimental/ study design, selection of topic, formulation of objectives ,work plan, sampling, data collection, questionnaire and surveys, statistical interpretation of the results, introduction to biostatistics, application of statistics in medical sciences, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram, preparations, measures of central tendency and dispersion, sampling techniques and sample size calculation, types of biological data, simple random sampling, sampling distribution and standard error, stratified random sampling, systematic and cluster sampling, statistical hypothesis, level of significance, test of significance, confidence interval, test involving binomial and normal distribution, chi-square distribution, its properties and application, properties of t-distribution and f-distribution, test of significance based on t-distribution and f- distribution, one-way classification, partitioning of sum of squares and degree of freedom; two-way classification, multiple comparison test; the analysis of variance models, basic principle of experimental designs, randomization, practical information on the use of database systems and software tools for data management and analysis, introduction to epidemiology, its uses, person, time, epidemics and types of epidemics, measures of disease frequency, morbidity and mortality rates, incidence, prevalence, cumulative incidence, incidence density, sensitivity and specificity, bias types, important study designs, sources of errors in epidemiologic studies, epidemiologic models.

Recommended Readings:

1. Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.

2. Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
3. Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford University Press, Latest Ed.
4. Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods. Belmont, CA: Lifetime Learning Publications, Latest Ed.
5. Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
6. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons.Inc. New York.
7. Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications.New Jersey USA.
8. Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, New Jersey USA.
9. Statistical Software: SPSS; EPIINFO; STATA; SAS

MED-712 [2+0 Credit hours]

MEDICAL BIOLOGY & GENETICS:

Objectives:

1. Describe cell structure and organization
2. Comprehend DNA replication, transcription, protein synthesis and enzymology
3. Know molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Describe molecular cloning and molecular tools for studying genes and gene activity
5. Describe DNA structure and function
6. Understand language of genetics and the terminology of molecular biology

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of cell structure and organization
2. Explain DNA replication, transcription, protein synthesis and enzymology
3. Explain molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Comprehend molecular cloning and molecular tools for studying genes and gene activity
5. Comprehend basic knowledge in the DNA structure and function
6. Explain the language of genetics and the terminology of molecular biology

Course Outline:

Overview of cell biology, the structure and function of biological macromolecules such as proteins, RNA, and DNA, signal transduction, and basic genetic mechanisms, broad overview of gene expression, nuclear organization and nucleic acid metabolism, gene transcription, chromatin structure and epigenetics, telomere biology, DNA replication and recombination, synthesis and folding of functional proteins, and RNA processing, stem cells, cytoskeletal dynamics, cell cycle, apoptosis, and protein transport, molecular mechanisms underlying key biological processes, membrane transport, signal transduction, immune recognition, molecular motors, gene expression, enzyme catalysis, ribozymes/riboswitches, structure determination, and structure-based design, role of atypical post-translational modifications of proteins in governing human health and disease, ubiquitin and ubiquitin-like modifiers, proline hydroxylation, histone modifications, protein oxidation, impact of modifications on cellular metabolism, apoptosis, autophagy, bacterial and viral infections, memory, neuro-pathology, human cancers, fundamentals of genetics, comprehension of the language of genetics and the terminology of molecular biology, role of genetics in diseases and disorders,

screening and diagnostic technologies in genetic diseases, gene therapy and genetic counseling. transmission genetics, principles and methods of genetic analysis, gene interactions, mapping, mutagenesis, clonal analysis, transgenic studies, use of mosaics, epigenetics and methods of study in human genetics, proteomics, genomics.

Recommended Readings:

1. Karp, Gerald. Cell and Molecular Biology: Concepts and Experiments with Student Study Guide John Wiley & Sons, Latest Ed.
2. David S. Latchman. Basic Molecular and Cell Biology Wiley Blackwell, Latest Ed.
3. Stephen L. Wolfe. Introduction to Cell and Molecular Biology.Wiley Blackwell, Latest Ed.
4. Lizabeth A. Allison. Fundamental Molecular Biology.Wiley Blackwell, Latest Ed.
5. Hart, D. L. and E. W. Jones. Essential Genetics: A Genomics Perspective. Sudbury, MA: Jones and Bartlett Publishers, Latest Ed.
6. Benjamin Pierce. Genetics. W. H. Freeman, Latest Ed.
7. Jeremy W. Dale, Malcolm van Schantz. From Gene to Genome.John Wiley & Sons Ltd, Latest Ed.
8. A Miches. Genetic Techniques for Biological Research.John Wiley & Sons Ltd, Latest Ed.
9. Leland Hartwell, Leroy Hood, Micheal Goldberg, Ann Reynolds, Lee Silver, Ruth Veres. Genetics: From Genes to Genomes. McGra-Hill Science, Latest Ed.

MED- 713 [2+0 Credit hours]

MEDICAL EDUCATION, ETHICS & WRITING:

Objectives:

1. Comprehend principles of module development, adult learning and assessment
2. Apply effective teaching skills including small group & large group learning activities
3. Describe skills of writing test items for knowledge, skills and behavioral objectives
4. Comprehend concepts of bioethics, principles of ethics & related ethical issues in biomedical research
5. Describe the rationale for the use of subjects and animals in research
6. Describe literature search and ways to conduct this search
7. Describe the components and write up of research proposal, thesis, article and grants

Learning Outcome:

1. Upon completion of course the students will be able to:
2. Demonstrate understanding of the principles of module development, adult learning and assessment
3. Demonstrate effective teaching skills including small group & large group learning activities
4. Demonstrate skills of writing test items for knowledge, skills and behavioral objectives
5. Comprehend the fundamental concepts of Bioethics
6. Apply the principles of ethics in the areas of medical and biological research
7. Understand the rationale for the use of subjects and animals in research
8. Identify the ethical issues related to cloning, genetic & stem cell research
9. Describe literature search and ways to conduct this search
10. Comprehend the parts of synopsis , thesis and grant proposal writing
11. Critically analyze data, design a project and write up of research article
12. Present and communicate research articles/research data in conferences and symposia

Course Outline:

Module development, adult learning, assessment, teaching skills, teaching strategies, framing out of objectives, formulation of BCQ's and SEQ's, Awareness of proper ethical conduct in biomedical research, appropriate techniques for written and oral presentations as well as ethics and standard practices for record keeping, data analysis, and authorship, ethical issues involved in the planning, implementation and completion of clinical research, understanding the rationale for human subject protection, understanding the mission and function of the IRB, understanding the processes and procedures of the IRB, knowledge of the preparation of an IRB application for submission, understanding the regulatory issues and requirements (State, Federal and Institutional) related to clinical and translational research, understanding and compliance with ethical issues involved in the recruitment of research participants including vulnerable populations, understanding the informed consent process, and understanding the ethical and professional issues involved in clinical and translational research, mentoring and collaboration, academia-industry collaboration, controversies in clinical equipoise, issues in global health research and genetic research, intellectual property, ethical issues in genetic research, cloning and stem cell research, authorship in publication of research, data safety and monitoring boards, privacy and confidentiality issues in research, compensation for research-related injury, deception in research, therapeutic misconception, ethics for animals in research, typical components of a research proposal, abstract, problem identification, problem definition and problem justification, goals and objective, research questions and hypothesis, resource requirements, analysis plan, plan for interpretation, dissemination, logistics and work schedule, bibliography, appendices, selecting fund mechanisms, writing individual grant sections and understanding administrative policies, cover letter, proposal narrative, project budget, letters of support, synopsis writing, components of synopsis and thesis writing, component of research article, literature search by different methods, books, Journals, periodicals, use of different websites, search engines writings, e-books, referencing software, plagiarism & language check software.

Recommended Readings:

1. Arifullah, Shahnaz. and Bhatti K.M Research process simplified, Peshawar Latest Ed.
2. W.H.O. Training manual on health research methodology Latest Ed.
3. The Psychology of Interpersonal Behaviour (Penguin Psychology) by Michael Argyle
4. Skilled Interpersonal Communication: Research, Theory and Practice, 5th Edition by Owen Hargie
5. The Interpersonal Communication Book by Joseph A. DeVito
6. The Complete Guide to Medical Writing by Mark Stuart and Mark Stuart
7. A-Z of Medical Writing by Tim Albert
8. Medical Writing: A Guide for Clinicians, Educators, and Researchers by Robert B. Taylor

MED- 714 [2(1+1) credit hours]

INSTRUMENTS AND ANIMAL USE IN RESEARCH:

Objectives:

1. Describe the role of technology in biomedical research
2. Explain the principle of instruments used in medical research
3. Explain standard operative procedures (SOP) of common instruments used in medical research
4. Comprehend the need of laboratory animals use in medical research
5. Describe the standard procedures for laboratory animal handling, care, restraining, drug administration, and blood drawing
6. Describe analgesia, anesthesia, euthanasia and Animal Welfare Ordinance for laboratory animals

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend the importance of technology in research
2. Explain the principle of instruments used in medical research
3. Identify the need and commonly used laboratory animals
4. Describe the basic concepts of laboratory animal handling, care and Animal Welfare Ordinance
5. Demonstrate the techniques of animal restraining, drug administration, blood drawing
6. Comprehend the techniques of analgesia, anesthesia and euthanasia in laboratory animals

Course Outline:

Centrifuge machines, different type of microscopes, spectroscope, chromatography, Power lab system, hot plate, analgesia meter, microtome, oven, ECG machine, pH meter, electronic balance, PCR, HPLC, electrophoresis, in-vitro & vivo methods of drug screening, high performance liquid chromatography, handling experimental animals in the laboratory, the type of animal, looking after these experimental animals, handling animals gently, following the guidelines of ethical consideration for animal use, genetic quality, strain / stock breeding system ,quality breeder / supplier, sex, age, body weight, health status of animals, hygiene barrier in maintenance, nutrition, quality drinking water, maintenance, cage, type (dimensions), bedding, number of animals per cage, animal room, ventilation, temperature, relative humidity, lighting ,noise ,other animals ,transportation ,means of transportation ,transport cage ,food supply animals care, experimental techniques, standardization of techniques, time of intervention, animal quarantine, use of defined animals in appropriate conditions, reducing stress on the animals, generating reproducible and reliable results, biological characteristics and husbandry requirements of the species, animal welfare, use of animals for teaching, research and testing, administration of drugs through oral and par-enteral routes, blood collection from tail vein and cardiac puncture, oral feeding, Sexing, reducing pain and distress, anesthesia, euthanasia.

Recommended Readings:

1. Biochemical Methods: A Concise Guide for Students and Researchers (Life Sciences). Latest edition
2. Guide for the care and use of laboratory animals. 8th edition. National Academies press. Washington DC.www.nap.edu

MED-715 [Essential- No credit hour]

Journal Club:

Objectives:

1. Describe resources for collection of literature
2. Describe the ways to prepare presentation on a given topic
3. Prepare comprehensive lecture from available resources
4. Critically analyze the published papers with strengths and limitations

Learning Outcome:

Upon completion of Seminars/Workshops etc. the students will be able to:

1. Collect information from the available resources
2. Prepare a presentation on a given topic
3. Deliver a lecture and manage a question-answer session
4. Work as a productive member of a task force

Course Outline:

Critically reviewing the published paper(s) of choice and elaborating in detail the findings described on weekly basis in the research journal club/seminar, critical thinking on the provided research literature, report writing, presentations.

Recommended Activities:

1. Compulsory Journal Clubs
2. Essential Seminars
3. Conferences
4. Workshops

Resources:

1. Internet
2. Libraries
3. Peer Advice

MED-716[Essential- No credit hour]

Teaching Internship:

Objectives:

1. Understand class management and control
2. Know the principles of effective teaching
3. Develop teaching skills and strategies

Learning Outcome:

Upon completion of teaching internship the students will be able to:

1. Manage and control the undergraduate class
2. Apply the principles of effective teaching
3. Professionally groom the teaching skills

Course Outline:

Working and duties, academic and administerial tasks performed by the student in the department and institution as faculty member including taking up of lectures, case based sessions, problem based learning sessions, demonstrations, mentoring of undergraduate students etc.

Resources:

1. Internet
2. Libraries
3. Peer Advice
4. Students feedback

THS-700 & THS-701

Thesis Research Work: [6 Credit hours]

Course Title: NEUROANATOMY WITH HEAD & NECK

Course Code: ANA-731

Credit Hours: 3(2+1)

Pre-requisite:

General outline of nervous system

Bones of head and neck

Basic differences between somatic and autonomic nervous system

Objectives:

1. Identify the gross structure of various components of the nervous system

2. Explain the gross structure of the vertebral column and its associated anomalies
3. Illustrate structures seen in the cross sections of the spinal cord along with their functions
4. Describe the pathway of the ascending tracts and their connections
5. Describe the pathway of the descending tracts and their connections
6. Explain the gross structure of different parts of brain
7. Name the sulci and gyri on a human brain specimen
8. Identify the cranial nerves on a human brain specimen
9. Explain the course and function of the cranial nerves
10. Explain the cross-sectional anatomy of various parts of the central nervous system
11. Differentiate common lesions and diseases related to the nervous system
12. Describe the autonomic system
13. Describe the microscopic features of cerebral cortex
14. Describe the microscopic features of cerebellar cortex
15. Interpret the function of cells in the cerebral and cerebellar cortex
16. Co-relate the anatomical knowledge of the nervous system with functions
17. Describe the development of the forebrain, midbrain and hindbrain
18. Understand and interpret the gross structure of various parts of head and neck
19. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the head and neck
20. Correlate the brain, spinal cord and various structures of head and neck with X-ray, CT scan and MRI.
21. Explain the gross structure of eye and ear with clinical correlates
22. Apply the knowledge to solve clinical problems related to Anatomy
23. Describe the development of pharyngeal apparatus, face, eye, ear and nose

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of the various components related to the nervous system
2. Co-relate the functions of the brain and spinal cord with their associated disorders
3. Relate the development of the brain and the effect it has on the new born with congenital anomalies
4. Perform the tests of cranial nerves and understand their functions along with their abnormalities
5. Describe the microscopic features of the nervous system and link it to nervous disorders
6. Describe the development of the nervous system and facial structures and link it to nervous disorders

Course Outline: Introduction of the nervous system and its components; Articulated Cranium and cranial cavity with relation to various parts of the brain; Spinal Cord; Meninges and subarachnoid cisterns; Medulla Oblongata; Pons; Cerebellum; Fourth ventricle; Midbrain; Diencephalon; Third ventricle; Sulci and Gyri of Telencephalon (Cerebrum); Lateral Ventricle; Limbic System; Basal ganglia; White matter of cerebrum; Blood Supply of the Nervous System; Dural venous sinuses; Sensory, motor, visual and auditory pathways; Nuclei of the cranial nerves, pathway and area of supply; Autonomic Nervous System; Cervical vertebrae; Cervical fascia; Triangles of neck; Suprahyoid and infrahyoid muscles; Cervical plexus; Lymphatic drainage of head and neck; Carotid vessels; Mouth and oral cavity; Tongue; Tonsils; Trachea and oesophagus; Face, muscles and nerve supply; Muscles of mastication; Temporomandibular joint; Ear; Orbit, Eye ball and Extraocular muscles; Parasympathetic ganglia; Cervical ganglia; X-ray, CT and MRI scan of head and Neck.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Carpenter MB. Text book of Neuroanatomy. Baltimore, U.S.A, Williams and Wilkins:

2. Snell RS. Clinical Neuroanatomy for Medical Students. Philadelphia, U.S.A. Lippincott Williams and Wilkins:
3. Standring S. Gray's Anatomy. The Anatomical Basis of Clinical Practice, Churchill Livingstone, London, UK.
4. Snell RS. Clinical Anatomy for Medical Students. Philadelphia USA Lippincott Williams and Wilkins.
5. Sinnatamby CS. Last's Anatomy Regional and Applied, Churchill Livingstone, UK
6. Moore K.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Lippincott Williams and Wilkins.

Journals:

1. Muscle and Nerve
2. Anatomia, Histologia, Embryologia
3. Journal of Anatomy

Reference Book:

Arthur John Gatz, John Tinkham Manter, and Sarah Winans Newman. Manter and Gatz's Essentials of Clinical Neuroanatomy and Neurophysiology

Websites: Gray's Anatomy <http://www.bartleby.com/107/>

Instant Anatomy <http://www.instantanatomy.net/>

Sixteen Week Lesson Plan:

<u>Week No</u>	<u>Course Contents</u>
Week 1	Gross structure and cross sections of spinal cord
Week 2	Gross structure and cross sections of brain stem
Week 3	Sulci and gyri on a human brain, cortical areas, different type of white fibers Quiz -1
Week 4	Vertebral column and its associated anomalies Assignment-1
Week 5	Diencephalon, Basal nuclei and limbic system
Week 6	Norma of skull, neurocranium and viscerocranium Quiz-2
Week 7	Face with neurovascular supply and associated fossae
Week 8	Orbit, eye ball and extraocular muscles
Week 9	Mid-Term Semester Exam
Week 10	Course and function of the cranial nerves
Week 11	Development of brain, pharyngeal apparatus, face, and special sense organs
Week 12	Common lesions and diseases related to the nervous system Quiz-3
Week 13	Autonomic system Assignment-2
Week 14	Microscopic features of cerebral and cerebellar cortex
Week 15	Triangles of neck, cervical plexus, Parasympathetic and cervical ganglia, Lymphatic drainage of Head & Neck Quiz-4
Week 16	Presentation: Development of the brain
Week 17	Final Semester Exam
Week 17	Final Semester Exam

Course Title: **GASTROINTESTINAL TRACT**

Course Code: ANA-732

Credit Hours: 3 (2+1)

Pre-requisite:

Topography of Abdomen

Bones of axial skeleton

Knowledge about parts of GIT

Objectives:

1. Identify the planes dividing abdomen into nine regions
2. Explain the structures of anterior abdominal wall
3. Explain the formation of inguinal canal
4. Explain the arrangement of peritoneum with peritoneal recesses and fossae
5. Describe the gross features of oral cavity, pharynx, oesophagus, stomach, small and large intestine, rectum and anal canal, with their blood supply, lymphatic drainage and clinical correlates
6. Describe the microscopic features of oesophagus, stomach, small and large intestine, rectum and anal canal with their clinical correlates
7. Illustrate the microscopic features of parts of GIT
8. Describe the developmental anatomy of foregut, midgut and hindgut
9. Describe the gross structure of liver with its blood supply, lymphatic drainage, peritoneal reflections and porto-systemic anastomosis
10. Co-relate the porto-systemic anastomosis with portal hypertension
11. Explain the gross structure of gall bladder and pancreas
12. Describe the microscopic anatomy of liver, gall bladder and pancreas
13. Illustrate the microscopic structure of liver, gall bladder and pancreas
14. Explain the structures present on posterior abdominal wall
15. Interpret the structures on X-ray ultrasound, CT and MRI scan
16. Apply the knowledge to solve clinical problems related to GIT
17. Understand the anatomy of common incisions

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of the various components related to the GIT
2. Correlate the structure and blood supply of GIT with various disorders
3. Relate the development of the GIT with the effects on the new born with congenital anomalies
4. Perform abdominal examination and relate the observations with their abnormalities
5. Identify various structures on X-ray, ultrasound, CT and MRI scan with clinical correlation
6. Describe the microscopic features of the different parts of GIT and associate them to common diseases

Course Outline: Introduction of anterior abdominal wall, bony pelvis and lumbar vertebrae; Rectus sheath; Inguinal canal; oral cavity, pharynx, and oesophagus; Stomach; Liver and ligaments; Lesser and greater sacs; Small intestine; Large intestine; Abdominal aorta; Inferior vena cava; Spleen; Pancreas; Mesentery; Compartments and spaces of abdominal cavity; Blood supply of GIT; Anal canal; Ischiorectal fossa; Surgical anatomy of incisions; Common investigations

Resources

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Sinnatamby CS. Last's Anatomy Regional and Applied London, Churchill Livingstone, UK..
3. Gray's Anatomy. The Anatomical Basis of Clinical Practice. Standring S. Elsevier London, Churchill Living Stone
4. Moore KL, Dalley AF, Agur AMR. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins.

Journals:

1. Anatomia, Histologia, Embryologia
2. Development Growth and Differentiation
3. Journal of Anatomy

Reference Book:

Agur AMR, Dalley AF. Grant's Atlas of Human Anatomy. Lippincott William & Wilkins.

Websites:

Gray's Anatomy <http://www.bartleby.com/107/>

Instant Anatomy <http://www.instantanatomy.net/>

Sixteen Week Lesson Plan

<u>Week No</u>	<u>Course Contents</u>
Week 1	Gross structure of anterior abdominal wall and formation of inguinal canal
Week 2	Peritoneum and peritoneal reflections, recesses and fossae
	Quiz -1
Week 3	Gross structure of oral cavity, pharynx, esophagus & stomach
Week 4	Gross features of small and large intestine
	Assignment-1
Week 5	Gross features of rectum and anal canal with clinical correlates
Week 6	Microscopic features of GIT Quiz-2
Week 7	Gross features of Liver
Week 8	Developmental Anatomy of foregut
Week 9	Mid-Term semester Exam
Week 10	Gross features of gall bladder and pancreas
Week 11	Microscopic structure of Liver, gall bladder and pancreas
Week 12	Development of midgut and hindgut
	Quiz-3
Week 13	Developmental anomalies of foregut, midgut& hindgut
	Assignment-2
Week 14	Porto-systemic shunts with clinical correlates, radiological anatomy of GIT
	Gross structure of posterior abdominal wall
Week 15	Quiz-4
Week 16	Presentation: development of the GIT
Week 17	Final Semester Exam
Week 18	Final Semester Exam

ELECTIVES DESCRIPTION**TISSUE PROCESSING**

Course code MED-706

Credit Hours03 (1+2)

- Objectives:** Identify the tissue at cellular level
- Identify the process of tissue preparation used for light microscopy
- Identify the fixatives used for tissue preservation
- Discuss tissue processing techniques
- Recognize the process of paraffin embedding
- Identify the process of tissue sectioning
- Identify the process of dehydration and clearing
- Discuss the chemical basis of staining
- Identify basic histological staining
- Discuss different kinds of tissue staining

Course Learning Outcomes (CLOs)

Upon completion of the course, the student would be able to:

1. Perform tissue processing and microtomy
2. Perform the process of tissue sectioning on microtome
3. Perform histological staining
4. Comprehend the structure of tissue at cellular level

Course Outline Fixation of tissues; Phenomenon, Common fixatives used or available; composition, advantages and disadvantages; Clearing agents; Paraffin Embedding process; Sectioning Process; Microtomes and knives, their types and uses. Haematoxylin and Eosin. Mounting; Vital and supravital dyes and study of cells; Freezing microtome and frozen sectioning

Resources

Recommended Books:

1. Kelly, D.E, Wood, R.L, Enders, A.C. Bailey's Text Book of Microscopic Anatomy. Baltimore, U.S.A, Williams and Wilkins.
2. [Ross MH, Pawlina W.](#) Histology: A Text and Atlas, with Correlated Cell and Molecular Biology. Lippincott Williams & Wilkins.
3. Bancroft JD, Gamble M. Theory and practice of Histological Techniques. Philadelphia, PA: Churchill Livingstone/Elsevier.

Journals:

1. Journal of Histology & Histopathology
2. [European Journal of Cell Biology](#)
3. Cell and Tissue Research
4. Archives of Histology and Cytology
5. Journal of Microscopy

Reference Book:

Lesson CR, Lesson TS. Histology. Philadelphia .S.A, W. B. Saunders and Company.

Websites:

www.histology-world.com/

CADAVERIC DISSECTION

Course Code MED-708

Credit Hours: 03 (1+2)

Objectives:

1. To improve and expand knowledge of the anatomy and function of organs & structures of the different region
2. Experience the principal methods by which gross anatomy is taught in most health professional curricula.
3. Study the anatomical structure and function of the thorax, Upper & lower extremity, thorax, abdomen, head and neck, and brain through dissection of a cadaver, utilization of models, and videotapes

Course Learning Outcomes (CLOs): Upon completion of course the students will be able to:

1. Understand and interpret the gross structure of various parts of human body
2. Identify the bones, joints, muscles, viscera and blood vessels

3. Identify and correlate the nerve injuries at various levels
5. Understand the correlation of surgical incisions with langer's lines

Course Outline: Dissection of human cadaver; Understand the Anatomy of common incisions; Preservation of prospected parts of human cadaver

Resources: Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Sinnatamby CS. Last's Anatomy Regional and Applied. Churchill Livingstone, London.
2. Tank P, Grant JCB. Lippincott William & Wilkins. Grant's Dissector, Guide for Human Anatomy.

Journals:

1. Journal of Anatomy
2. Anatomy Research International

Reference Book:

Timmons MJ, Hutching RT, Ober WC, Garrison CW. Human Anatomy: Laboratory Guide and Dissection Manual, 4th Edition

Websites:

www.onlinedissector.com

ADVANCED MICROSCOPIC TECHNIQUES

Course Code MED-709

Credit Hours: 03 (1+2)

Objectives:

1. Comprehend the basic knowledge, uses and applications of different types of microscopes.
2. Handle microscopes commonly used in research and histology labs
3. Understand the principles of histochemical staining
4. Explain the basis of immunohistochemistry
5. Understand the principles of polarizing microscopy
6. Comprehend the basis of electron microscopy

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Identify the general and special applications of light and advanced microscopes according to research techniques
2. Advantages and disadvantages of different microscopes
3. Knowledge of special stains, immunohistochemistry technique and preparation of tissue for electron microscopy

Course Outline: Introduction to different types of microscopes;

Microscopes: Components, phenomenon and uses; Simple and compound optical microscopes, Fluorescent microscope, Polarizing microscope, Dark field microscope, Electron microscope; Microphotography; Special stains: Oil Red-O for Lipids, Mallory's connective tissue stain, Periodic Acid Schiff (PAS) for glycogen, immuno staining

Resources: Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Bancroft JD, Cook HC. Manual of Histological Techniques and their Diagnostic application. Philadelphia, PA: Churchill Livingstone/ Elsevier.

Journals:

1. Journal of Histology & Histopathology
2. Journal of Microscopy
3. Journal of Pathology

Reference Book:

Lesson CR, Lesson TS. Histology. Philadelphia .S.A, W. B. Saunders and Company.

Websites:

Histologylab.ccnmtl.columbia.edu/histological_techniques

Course Title: MICROSCOPIC STRUCTURE OF TISSUE

Course Code: ANA-733

Credit Hours: 3 (2+1)

Pre-requisite:

Basic principles of image formation

Use of light microscope

Routine tissue staining

Objectives:

1. Describe the use of objective and ocular micrometer
2. Demonstrate the steps of micrometry with the help of ocular and stage micrometer
3. Describe the microscopic features of different types of epithelial tissues and their functional significance
4. Explain the different types of cell junctional complex and discuss their functional importance
5. Describe the microscopic features of connective tissue
6. Differentiate between different types of connective tissue
7. Describe the microscopic features of skeletal, cardiac and smooth muscles
8. Describe the microscopic features of compact and spongy bone
9. Describe the microscopic features of hyaline, fibrous and elastic cartilage
10. Describe the microscopic features of artery, vein and capillary
11. Describe the microscopic features of Integumentary system

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Understand and interpret the microscopic structure of all the tissues and organs of the human body
2. Comprehend the functional correlation of the histological structure of clinically important tissues and organs

Course Outline:

Cell & its organelles and cell junctions; Epithelium and surface modifications; Connective Tissue; Cartilages; Bone; Muscular tissue; Circulatory System; Integumentary system.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Junqueira LC, Carneiro J. Basic histology. California, U.S.A, Lange Medical publication.
2. Kelly, D.E, Wood, R.L, Enders, A.C. Bailey's Text Book of Microscopic Anatomy. Baltimore, U.S.A, Williams and Wilkins.
3. Burkit HG, Young B, Heath JW. Wheater's Functional histology London, Churchill living stone.

4. [Ross MH](#), [Pawlina W.](#) Histology: A Text and Atlas, with Correlated Cell and Molecular Biology. Lippincott Williams & Wilkins.

Journals:

1. Journal of Histology & Histopathology
2. [European Journal of Cell Biology](#)
3. Cell and Tissue Research
4. Archives of Histology and Cytology

Reference Book:

Lesson CR, Lesson TS. Histology. Philadelphia .S.A, W. B. Saunders and Company.

Websites:

Histology-world www.histology-world.com/

Sixteen Week Lesson Plan

<u>Week No</u>	<u>Course Contents</u>
Week 1	Steps of Tissue processing and microtomy
Week 2	Use of special stains in different types of tissues
Week 3	Microscopic features of epithelial tissue Quiz -1
Week 4	Cell junctional complexes with their functional significance Assignment-1
Week 5	Surface and basal specialization of epithelia with clinical correlates
Week 6	Different types of connective tissue Quiz-2
Week 7	Making slides of epithelium and connective tissue
Week 8	Microscopic features of skeletal, cardiac and smooth muscle
Week 9	Mid-Term Semester Exam
Week 10	Microscopic features of compact and spongy bone
Week 11	Microscopic features of different types of cartilage
Week 12	Microscopic features of artery and vein Quiz-3
Week 13	Microscopic features of capillaries with clinical correlates Assignment-2
Week 14	Microscopic structure of lymph vessels
Week 15	Microscopic structure of Integumentary system Quiz-4
Week 16	Presentation: Epithelial and connective tissue
Week 17	Final Semester Exam
Week 18	Final Semester Exam

Course Title: DEVELOPMENTAL ANATOMY

Course Code: ANA-734

Credit Hours: 3 (2+1)

Pre-requisites:

Mitosis and Meiosis

Cell cycle

Objectives:

1. Discuss phases and outcomes of fertilization
2. Discuss the process of In-vitro fertilization
3. Discuss cleavage from amphioxus to mammals
4. Describe the events of second week of development

5. Discuss gastrulation, comparative approach, with derivatives of each germ layer
6. Explain the formation of notochord and process of neurulation
7. Discuss comparative Placentation of twins
8. Explain the reasons and sites of ectopic pregnancy
9. Differentiate between embryonic and foetal stages
10. Discuss development of external body form
11. Discuss Teratogenesis, with emphasis on environmental teratogens and their effects
12. Discuss the development of integumentary system
13. Demonstrate the different stages of chick embryo
14. Study the slides showing the developmental stages of chick embryo

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Understand and interpret various aspects of normal human development
2. Compare the development of chick embryo to human development
3. Explain the mechanism of occurrence, features and clinical aspects of common congenital anomalies
4. Explain the basis of chromosomal defects
5. Relate the features of syndromes and association

Course Outline: Cell division & chromosomal abnormalities; Gametogenesis (oogenesis & spermatogenesis), Ovarian and uterine cycle; Fertilization; Implantation & ectopic pregnancies; Embryonic period (organogenesis); Fetal period; Fetal membranes & Placenta; Multiple pregnancies; Birth defects & pre-natal diagnosis.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Moore K, Persaud TVN, Torchia M. Clinically Oriented Embryology. Philadelphia, USA, W.B. Saunders and Company.
2. Saddler TW. Langman's Medical Embryology. Philadelphia, USA, Lippincott Williams & Wilkins.
3. Developmental Anatomy by Arey

Journals:

1. Human Genetics & Embryology
2. The Journal of Clinical embryology
3. Journal of Embryology and Developmental Biology
4. Edorium Journal of Anatomy and Embryology
5. Development, Growth and Differentiation
6. International Journal of Developmental Biology
7. Birth Defects Research Part A: Clinical and Molecular Teratology
8. Birth Defects Research Part A: Developmental and Reproductive Toxicology

Reference Book:

Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH, Philippa H. Larsen's human embryology (5th ed; 2015). New York; Edinburgh: Churchill Livingstone

Websites:

<https://embryology.med.unsw.edu.au/>

<https://sites.temple.edu/embryology/recommended-embryology-website/>

Sixteen Week Lesson Plan

<u>Week No</u>	<u>Course Contents</u>
Week 1	Gametogenesis, ovarian and uterine cycle
Week 2	Phases and outcomes of fertilization, in-vitro fertilization
Week 3	Events of second week of development Quiz -1
Week 4	Gastrulation with comparative approach Assignment-1
Week 5	Notochord formation and neurulation
Week 6	Comparative placentation Quiz-2
Week 7	Fetal Membranes
Week 8	Different stages of Chick Embryo slides
Week 9	Mid-Term Semester Exam
Week 10	Embryonic and Fetal period
Week 11	Twin pregnancy
Week 12	Teratogenesis Quiz-3
Week 13	Development of integumentary system Assignment-2
Week 14	Making of Chick Embryo slides
Week 15	Presentation: first and second week of development Quiz-4
Week 16	Presentation: Third week of Development
Week 17	Final Semester Exam
Week 17	Final Semester Exam

Course Title: MUSCULOSKELETAL SYSTEM**Course Code:** ANA-735**Credit Hours:** 3 (2+1)**Pre-requisite:**

Bones of axial and appendicular skeleton

Gross and microscopic features of skeletal muscles

Objectives:

1. Describe the gross features and muscle attachments of the scapula, clavicle, humerus, radius, ulna and bones of hand
2. Describe the anterior and posterior axioappendicular muscles
3. Explain the articulating bones, type, ligaments and movements of the pectoral girdle, shoulder, elbow and wrist joint, and joints of hand
4. Describe the location, extent, structure, neurovascular supply and lymphatic drainage of mammary gland with clinical correlates
5. Identify the boundaries of axilla with its contents
6. Describe the formation, branches and injuries at different levels of brachial plexus
7. Describe the muscles of the flexor and extensor compartments of arm and forearm
8. Describe the neurovascular supply of upper limb with clinical correlates
9. Identify the general features, attachments and differentiating points of male and female pelvis
10. Identify the general features and muscle attachments of the hip bone, femur, tibia, fibula and bones of foot
11. Explain the muscles and neurovascular supply of the gluteal region, and compartments of thigh and leg

12. Discuss the formation and clinical aspect of Lumbosacral plexus
13. Describe the neurovascular supply of lower limb
14. Classify the arches of foot, structure and supporting mechanism of the foot
15. Identify the bones and joints of upper and lower limbs on X-ray

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Understand and interpret the gross structure of various parts of the upper and lower limbs
2. Identify the bones, joints, muscles, nerves and blood vessels in cross sections, and X-rays of the upper and lower limbs
3. Identify and correlate the nerve injuries at various levels
4. Relate the structure and lymphatic drainage of mammary gland to the spread of cancer

Course Outline: Brachial plexus and injuries at various levels; muscles anterior and posterior compartments of arm and forearm with neurovascular supply; joints of upper and lower limbs; structures present in gluteal region, thigh, leg and foot including bones, muscles, nerves, blood vessels and joints; Surface anatomy of mammary gland, and arteries of upper and lower limbs, X-rays of limbs

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Sinnatamby CS. Last's Anatomy Regional and Applied. Churchill Livingstone, London.
2. Standring S. Gray's Anatomy: The Anatomical Basis of Clinical Practice. Elsevier Churchill Living Stone, London.
3. Moore KL. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins.

Journals:

1. Journal of Anatomy
2. Anatomy Research International
3. Surgical and Radiologic Anatomy
4. Translational Research in Anatomy

Reference Book:

Agur AMR, Dalley AF. Grant's Atlas of anatomy. Lippincott Williams and Wilkins

Websites:

Gray's Anatomy <http://www.bartleby.com/107/>

Sixteen Week Lesson Plan

Week No	Course Contents
Week 1	Gross features and muscle attachments of bones of upper limb
Week 2	Anterior and posterior axio-appendicular muscles
Week 3	Mammary gland Quiz -1
Week 4	Axilla and its contents Assignment-1
Week 5	Brachial plexuses with its branches and injuries
Week 6	Compartments of arm and forearm Quiz-2
Week 7	Gross and functional anatomy of hand
Week 8	Joints of upper limb
Week 9	Mid-Term Semester Exam
Week 10	Gross features, muscle attachments of bones of lower limb
Week 11	Gluteal region, greater and lesser sciatic foramina
Week 12	Anterior, medial and posterior compartments of thigh Quiz-3
Week 13	Anterior, medial and posterior compartments of leg Assignment-2

Week 14	Foot with its clinical correlates
Week 15	Joints of lower limb Quiz-4
Week 16	Neurovascular supply of lower limb
Week 17	Final Semester Exam
Week 18	Final Semester Exam

Course Title: **CARDIOVASCULAR & RESPIRATORY SYSTEM**

Course Code: ANA-736

Credit Hours: 3 (2+1)

Pre-requisite:

Topography of thorax

Bones of Axial skeleton

Objectives:

1. Describe mediastinum, its divisions and contents and thoracic cage
2. Describe the gross morphology of trachea and bronchial tree with their clinical significance
3. Explain bones and joints of thoracic cage and intercostal spaces
4. Describe the muscles of respiration
5. Describe the gross structure of diaphragm
6. Explain the surfaces, borders, fissures, lobes and roots of lungs with their neurovascular supply
7. Describe the layers, functions and nerve supply of pleura
8. Explain the microscopic features of upper and lower respiratory tract with their clinical significance
9. Describe lymphatic drainage of thorax and thoracic duct
10. Interpret the clinical significance of Broncho pulmonary segments
11. Describe the anatomical position, borders, surfaces, wall and fibrous skeleton of the heart
12. Describe the gross and microscopic features of artery, vein, capillaries and lymphatic vessels
13. Describe the internal structure of the heart, with gross anatomy of heart valves and neurovascular supply with clinical correlation
14. Describe pericardium and pericardial sinuses
15. Describe the position, extent and branches of ascending aorta, arch of aorta and descending aorta, pulmonary trunk, superior and inferior vena cava, and brachiocephalic vein
16. Describe the development of respiratory and cardiovascular systems
17. Identify the surface and radiological anatomy of respiratory and cardiovascular systems

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Understand and interpret the gross structure of various parts of the thorax
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the thorax
3. Relate the structure of cardiovascular and respiratory systems with clinical disorders
4. Relate the congenital malformations of limbs, trachea, lungs, heart and blood vessels with developmental defects
5. Identify the structures of CVS and respiratory system on plain radiograph, CT scan and MRI of chest

Course Outline: Surface anatomy of lungs, pleura, borders and valves of heart;

Structure and lymphatic drainage of thoracic cage; Intercostal spaces with their muscles and neurovascular bundle; Mediastinum, its subdivisions and contents; Pericardium; location, structure

and relations of heart with neurovascular supply; Pleural cavity with layers, extent and nerve supply of pleura; Gross structure of Lungs with neurovascular supply; Thoracic duct; Venous drainage of thoracic cavity; Splanchnic nerves, sympathetic trunk; Structure and nerve supply of diaphragm; X-ray, CT and MRI of thorax

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Sinnatamby CS. Last's Anatomy Regional and Applied. Churchill Livingstone, London.
2. Standring S. Gray's Anatomy: The Anatomical Basis of Clinical Practice. Elsevier Churchill Living Stone, London.
3. Moore KL. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins.

Journals:

1. Journal of Anatomy
2. Anatomy Research International
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4. Translational Research in Anatomy

Reference Book:

Agur AMR, Dalley AF. Grant's Atlas of anatomy. Lippincott Williams and Wilkins

Websites:

Gray's Anatomy <http://www.bartleby.com/107/>

Course Title: **UROGENITAL SYSTEM**

Course Code: ANA-737

Credit Hours: 3 (2+1)

Pre-requisite:

Topography of abdomen and pelvis

Bones of axial skeleton

Knowledge about parts of urinary and genital systems

Objectives:

1. Explain the structures present on posterior abdominal wall
2. Describe the gross structure of kidney with its blood supply
3. Discuss the gross structure and relations of ureter, urinary bladder and urethra with their blood supply and clinical correlates
4. Describe the microscopic features of kidney, ureter, urinary bladder and urethra with clinical correlation
5. Describe the development of the kidney, ureter, urinary bladder and urethra with congenital anomalies
6. Describe the formation of Pelvic diaphragm
7. Describe the gross structure of male and female reproductive organs with their blood supply, lymphatic drainage and clinical correlates
8. Describe the contents of perineum and superficial and deep perineal pouches
9. Describe the microscopic features of testis, epididymis, vas deference, seminal vesicle, prostate, ovary, uterine tube, uterus and vagina
10. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the abdomen and pelvis

11. Correlate the blood supply and lymphatic drainage of reproductive organs with different disorders
12. Describe the development of male and female reproductive organs
13. Apply the knowledge to solve clinical problems related to urinary and reproductive systems
14. Identify the urogenital organs on plain X-ray, ultrasound, CT and MRI

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Correlate the structure and blood supply of urogenital system with various disorders
2. Relate the development of the urinary and reproductive organs with the effects on the new born with congenital anomalies
3. Describe the microscopic features of the different parts of kidney, urinary tract, testis, vas deference, prostate, seminal vesicles, ovary, uterine tubes, uterus and vagina, and associate them to common diseases
4. identify the urinary and genital structures on plain X-ray, ultrasound, CT and MRI scans

Course Outline: Gross structure, microscopic features and development of Kidneys, ureter, urinary bladder, urethra, prostate, seminal vesicles, ovary, uterine tube, uterus and vagina; Pelvic diaphragm; Perineum; Perineal pouches; Neurovascular supply and lymphatic drainage; Spermatic cord, scrotum and testis;

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Sinnatamby CS. Last's Anatomy Regional and Applied. Churchill Livingstone, London.
2. Standring S. Gray's Anatomy: The Anatomical Basis of Clinical Practice. Elsevier Churchill Living Stone, London.
3. Moore KL. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins.

Journals:

1. Journal of Anatomy
2. Anatomy Research International
3. Surgical and Radiologic Anatomy

Reference Book:

Agur AMR, Dalley AF. Grant's Atlas of anatomy. Lippincott Williams and Wilkins

Websites:

Gray's Anatomy <http://www.bartleby.com/107/>

Instant Anatomy <http://www.instantanatomy.net/>

Course Title: RETICULOENDOTHELIAL SYSTEM

Course Code: ANA-738

Credit Hours: 3 (2+1)

Pre-requisite: Basic understanding of Immune system

Objectives: Discuss the basic components of Reticuloendothelial system

1. Explain the functions of B-Lymphocytes, macrophages, antigen-presenting cells and T-lymphocytes
2. Explain the gross features of lymph node, tonsils, thymus and spleen
3. Describe the microscopic features of lymph node, tonsils, thymus and spleen
4. Describe the developmental anatomy of lymph node, tonsils, thymus and spleen
5. Relate the abnormalities of lymphoid organs with different disorders

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Understand and interpret the gross and microscopic structure of the lymphoid organs
2. Relate the defects of lymphoid organs with autoimmune and other diseases
3. Correlate the congenital defects of lymphoid organs with other diseases

Course Outline: Gross and microscopic structure of bone marrow, lymph nodes, tonsils, thymus and spleen; developmental anatomy of lymphoid organs; Clinical correlation of lymphoid organs with different diseases

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Junqueira LC, Carneiro J. Basic histology. California, U.S.A, Lange Medical publication.
2. Kelly DE, Wood RL, Enders AC. Bailey's Text Book of Microscopic Anatomy. Baltimore, USA, Williams and Wilkins.
3. Ross MH, Pawlina W. Histology: A Text and Atlas, with Correlated Cell and Molecular Biology. Lippincott Williams & Wilkins.

Journals:

1. [European Journal of Cell Biology](#)
2. Cell and Tissue Research
3. Journal of Microscopy

Reference Book:

Lesson CR, Lesson TS. Histology. Philadelphia .S.A, W. B. Saunders and Company.

Websites:

Histology-world www.histology-world.com/

2. MPhil PATHOLOGY

Course title	MPhil Pathology
Specialization	<ul style="list-style-type: none"> • Microbiology • Histopathology (Specialization will be mentioned on the transcript)
Course duration	2 years (max 3 years)
Study system	Semester System
No. of regular semesters	4
Semester Duration	16 weeks teaching + 2 weeks examination
Total credit hours	30 credit hrs (24 credit hr. of course work + 6 credit hours research)

ROADMAP**Semester 1**

Course Code	Course Title	Credit Hours
MED-701	Research Methodology (University Requirement)	3+0
MED-712	Medical Biology & Genetics	2+0
MED-713	Medical Education, Ethics & Writing	2+0
MED-714	Instruments and Animal use in research	1+1
MED-715	Journal Club (Essential – No credit hour)	No credit hour
MED-716	Teaching Internship (Essential – No credit hour)	No credit hour
	Total	09

Semester 2

Course Code	Course Title	Credit Hours
PAT-740	General Pathology, Special Pathology-I & Basic Microbiology	2+1
PAT-741	Special Pathology-II, Special bacteriology & Mycology	2+1
	Elective- I	2+1
MED-715	Journal Club (Essential – No credit hour)	No credit hour
MED-716	Teaching Internship (Essential – No credit hour)	No credit hour
	Total	09

Semester 3

Course Code	Course Title	Credit Hours
	Elective-II	2+1
	Elective-III	2+1
THS-701	Thesis	3+0
MED-715	Journal Club (Essential – No credit hour)	No credit hour
MED-716	Teaching Internship (Essential – No credit hour)	No credit hour
	Total	09

Semester 4

Course Code	Course Title	Credit Hours
THS-701	Thesis	3+0
	Total	3+0
	TOTAL CREDIT HOURS	30

CORE COURSES

S. No	Course Code	Course Title	Credit Hours
1	MED-712	Medical Biology & Genetics	2+0
2	MED-713	Medical Education, Ethics & Writing	2+0
3	MED-714	Instruments and Animal use in research	1+1
4	PAT-740	General pathology, Basic Microbiology and Special Pathology-I	2+1
5	PAT-741	Special pathology-II, Special bacteriology and Mycology	3+0
6	THS-700	Thesis	3+0
7	THS-701	Thesis	3+0
8	MED-715	Journal Club	No credit hour
9	MED-716	Teaching Internship	No credit hour

HISTOPATHOLOGY ELECTIVES

S. No	Course Code	Course Title	Credit Hours
1	PAT-742	Tissue processing	1+2
2	PAT-743	Histopathology laboratory - procedures & reporting	1+2
3.	PAT-744	Endocrine & renal disorders	1+2
4.	PAT-745	Molecular pathology laboratory – Related to tissue pathology	1+2

MICROBIOLOGY ELECTIVES

S. No	Course Code	Course Title	Credit Hours
1.	PAT-746	Microbiology laboratory - procedures & reporting	1+2
2.	PAT-747	Molecular pathology laboratory – Related to infectiousdiseases	1+2
3.	PAT-748	Virology	1+2
4.	PAT-749	Parasitology	1+2

UNIVERSITY REQUIREMENT

S. No	Course Code	Course Title	Credit Hours
1	MED-701	Research Methodology	3+0

CORE COURSES DESCRIPTION

MED-701 [3+0 Credit hours]

RESEARCH METHODOLOGY, BIOSTATISTICS, EPIDEMIOLOGY:

Objectives:

1. Describe research, research methods, research studies, their designs and work feasibility
2. Describe types of data and ways of collection of data
3. Comprehend organization, categorization and analyses of collected data
4. Describe the fundamental concepts and methods of statistics in the areas of medical research
5. Demonstrate use of statistical computer software for data analysis
6. Explain the concepts and methods of epidemiology in the areas of medical research
7. Describe advantages and disadvantages of epidemiological studies

Learning Outcome:

Upon completion of course the students will be able to:

1. Acquire the basic knowledge of research, research studies, their designs and work feasibility
2. Organize, categorize and analyze the collected data
3. Apply fundamental concepts and methods of statistics in the areas of medical and biological research

4. Use of statistical computer software for data analysis
5. Apply fundamental concepts and methods of epidemiology in the areas of medical and biological research
6. Describe advantages and disadvantages of epidemiological studies

Course Outline:

Research and experimental/ study design, selection of topic, formulation of objectives ,work plan, sampling, data collection, questionnaire and surveys, statistical interpretation of the results, introduction to biostatistics, application of statistics in medical sciences, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram, preparations, measures of central tendency and dispersion, sampling techniques and sample size calculation, types of biological data, simple random sampling, sampling distribution and standard error, stratified random sampling, systematic and cluster sampling, statistical hypothesis, level of significance, test of significance, confidence interval, test involving binomial and normal distribution, chi-square distribution, its properties and application, properties of t-distribution and f-distribution, test of significance based on t-distribution and f- distribution, one-way classification, partitioning of sum of squares and degree of freedom; two-way classification, multiple comparison test; the analysis of variance models, basic principle of experimental designs, randomization, practical information on the use of database systems and software tools for data management and analysis, introduction to epidemiology, its uses, person, time, epidemics and types of epidemics, measures of disease frequency, morbidity and mortality rates, incidence, prevalence, cumulative incidence, incidence density, sensitivity and specificity, bias types, important study designs, sources of errors in epidemiologic studies, epidemiologic models.

Recommended Readings:

1. Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.
2. Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
3. Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford University Press, Latest Ed.
4. Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods. Belmont, CA: Lifetime Learning Publications, Latest Ed.
5. Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
6. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons.Inc. New York.
7. Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications.New Jersey USA.
8. Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, New Jersey USA.
9. Statistical Software: SPSS; EPIINFO; STATA; SAS

MED-712 [2+0 Credit hours]

MEDICAL BIOLOGY & GENETICS

Objectives:

1. Describe cell structure and organization
2. Comprehend DNA replication, transcription, protein synthesis and enzymology
3. Know molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Describe molecular cloning and molecular tools for studying genes and gene activity
5. Describe DNA structure and function
6. Understand language of genetics and the terminology of molecular biology

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of cell structure and organization
2. Explain DNA replication, transcription, protein synthesis and enzymology
3. Explain molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Comprehend molecular cloning and molecular tools for studying genes and gene activity
5. Comprehend basic knowledge in the DNA structure and function
6. Explain the language of genetics and the terminology of molecular biology

Course Outline:

Overview of cell biology, the structure and function of biological macromolecules such as proteins, RNA, and DNA, signal transduction, and basic genetic mechanisms, broad overview of gene expression, nuclear organization and nucleic acid metabolism, gene transcription, chromatin structure and epigenetics, telomere biology, DNA replication and recombination, synthesis and folding of functional proteins, and RNA processing, stem cells, cytoskeletal dynamics, cell cycle, apoptosis, and protein transport, molecular mechanisms underlying key biological processes, membrane transport, signal transduction, immune recognition, molecular motors, gene expression, enzyme catalysis, ribozymes/riboswitches, structure determination, and structure-based design, role of atypical post-translational modifications of proteins in governing human health and disease, ubiquitin and ubiquitin-like modifiers, proline hydroxylation, histone modifications, protein oxidation, impact of modifications on cellular metabolism, apoptosis, autophagy, bacterial and viral infections, memory, neuro-pathology, human cancers, fundamentals of genetics, comprehension of the language of genetics and the terminology of molecular biology, role of genetics in diseases and disorders, screening and diagnostic technologies in genetic diseases, gene therapy and genetic counseling, transmission genetics, principles and methods of genetic analysis, gene interactions, mapping, mutagenesis, clonal analysis, transgenic studies, use of mosaics, epigenetics and methods of study in human genetics, proteomics, genomics.

Recommended Readings:

1. Karp, Gerald. Cell and Molecular Biology: Concepts and Experiments with Student Study Guide John Wiley & Sons, Latest Ed.
2. David S. Latchman. Basic Molecular and Cell Biology Wiley Blackwell, Latest Ed.
3. Stephen L. Wolfe. Introduction to Cell and Molecular Biology.Wiley Blackwell, Latest Ed.
4. Lizabeth A. Allison. Fundamental Molecular Biology.Wiley Blackwell, Latest Ed.
5. Hart, D. L. and E. W. Jones. Essential Genetics: A Genomics Perspective. Sudbury, MA: Jones and Bartlett Publishers, Latest Ed.
6. Benjamin Pierce. Genetics. W. H. Freeman, Latest Ed.
7. Jeremy W. Dale, Malcolm van Schantz. From Gene to Genome.John Wiley & Sons Ltd, Latest Ed.
8. A Miches. Genetic Techniques for Biological Research.John Wiley & Sons Ltd, Latest Ed.
9. Leland Hartwell, Leroy Hood, Micheal Goldberg, Ann Reynolds, Lee Silver, Ruth Veres. Genetics: From Genes to Genomes. McGra-Hill Science, Latest Ed.

MED- 713 [2+0 Credit hours]

MEDICAL EDUCATION, ETHICS & WRITING:

Objectives:

1. Comprehend principles of module development, adult learning and assessment
2. Apply effective teaching skills including small group & large group learning activities

3. Describe skills of writing test items for knowledge, skills and behavioral objectives
4. Comprehend concepts of bioethics, principles of ethics & related ethical issues in biomedical research
5. Describe the rationale for the use of subjects and animals in research
6. Describe literature search and ways to conduct this search
7. Describe the components and write up of research proposal, thesis, article and grants

Learning Outcome:

1. Upon completion of course the students will be able to:
2. Demonstrate understanding of the principles of module development, adult learning and assessment
3. Demonstrate effective teaching skills including small group & large group learning activities
4. Demonstrate skills of writing test items for knowledge, skills and behavioral objectives
5. Comprehend the fundamental concepts of Bioethics
6. Apply the principles of ethics in the areas of medical and biological research
7. Understand the rationale for the use of subjects and animals in research
8. Identify the ethical issues related to cloning, genetic & stem cell research
9. Describe literature search and ways to conduct this search
10. Comprehend the parts of synopsis , thesis and grant proposal writing
11. Critically analyze data, design a project and write up of research article
12. Present and communicate research articles/research data in conferences and symposia

Course Outline:

Module development, adult learning, assessment, teaching skills, teaching strategies, framing out of objectives, formulation of BCQ's and SEQ's, Awareness of proper ethical conduct in biomedical research, appropriate techniques for written and oral presentations as well as ethics and standard practices for record keeping, data analysis, and authorship, ethical issues involved in the planning, implementation and completion of clinical research, understanding the rationale for human subject protection, understanding the mission and function of the IRB, understanding the processes and procedures of the IRB, knowledge of the preparation of an IRB application for submission, understanding the regulatory issues and requirements (State, Federal and Institutional) related to clinical and translational research, understanding and compliance with ethical issues involved in the recruitment of research participants including vulnerable populations, understanding the informed consent process, and understanding the ethical and professional issues involved in clinical and translational research, mentoring and collaboration, academia-industry collaboration, controversies in clinical equipoise, issues in global health research and genetic research, intellectual property, ethical issues in genetic research, cloning and stem cell research, authorship in publication of research, data safety and monitoring boards, privacy and confidentiality issues in research, compensation for research-related injury, deception in research, therapeutic misconception, ethics for animals in research, typical components of a research proposal, abstract, problem identification, problem definition and problem justification, goals and objective, research questions and hypothesis, resource requirements, analysis plan, plan for interpretation, dissemination, logistics and work schedule, bibliography, appendices, selecting fund mechanisms, writing individual grant sections and understanding administrative policies, cover letter, proposal narrative, project budget, letters of support, synopsis writing, components of synopsis and thesis writing, component of research article, literature search by different methods, books, Journals, periodicals, use of different websites, search engines writings, e-books, referencing software, plagiarism & language check software.

Recommended Readings:

1. Arifullah, Shahnaz. andBhatti K.M Research process simplified, Peshawar Latest Ed.
2. W.H.O. Training manual on health research methodology Latest Ed.
3. The Psychology of Interpersonal Behaviour (Penguin Psychology) by Michael Argyle
4. Skilled Interpersonal Communication: Research, Theory and Practice, 5th Edition by Owen Hargie
5. The Interpersonal Communication Book by Joseph A. DeVito
6. The Complete Guide to Medical Writing by Mark Stuart and Mark Stuart
7. A-Z of Medical Writing by Tim Albert
8. Medical Writing: A Guide for Clinicians, Educators, and Researchers by Robert B. Taylor

MED- 714 [2(1+1) credit hours]

INSTRUMENTS AND ANIMAL USE IN RESEARCH:

Objectives:

1. Describe the role of technology in biomedical research
2. Explain the principle of instruments used in medical research
3. Explain standard operative procedures (SOP) of common instruments used in medical research
4. Comprehend the need of laboratory animals use in medical research
5. Describe the standard procedures for laboratory animal handling, care, restraining, drug administration, and blood drawing
6. Describe analgesia, anesthesia, euthanasia and Animal Welfare Ordinance for laboratory animals

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend the importance of technology in research
2. Explain the principle of instruments used in medical research
3. Identify the need and commonly used laboratory animals
4. Describe the basic concepts of laboratory animal handling, care and Animal Welfare Ordinance
5. Demonstrate the techniques of animal restraining, drug administration, blood drawing
6. Comprehend the techniques of analgesia, anesthesia and euthanasia in laboratory animals

Course Outline:

Centrifuge machines, different type of microscopes, spectroscope, chromatography, Power lab system, hot plate, analgesia meter, microtome, oven, ECG machine, pH meter, electronic balance, PCR, HPLC, electrophoresis, in-vitro & vivo methods of drug screening, high performance liquid chromatography, handling experimental animals in the laboratory, the type of animal, looking after these experimental animals, handling animals gently, following the guidelines of ethical consideration for animal use, genetic quality, strain / stock breeding system ,quality breeder / supplier, sex, age, body weight, health status of animals, hygiene barrier in maintenance, nutrition, quality drinking water, maintenance, cage, type (dimensions), bedding, number of animals per cage, animal room, ventilation, temperature, relative humidity, lighting ,noise ,other animals ,transportation ,means of transportation ,transport cage ,food supply animals care, experimental techniques, standardization of techniques, time of intervention, animal quarantine, use of defined animals in appropriate conditions, reducing stress on the animals, generating reproducible and reliable results, biological characteristics and husbandry requirements of the species, animal welfare, use of animals for teaching, research and testing, administration of drugs through oral and par-enteral routes, blood collection from tail vein and cardiac puncture, oral feeding, Sexing, reducing pain and distress, anesthesia, euthanasia.

Recommended Readings:

1. Biochemical Methods: A Concise Guide for Students and Researchers (Life Sciences). Latest edition
2. Guide for the care and use of laboratory animals. 8th edition. National Academies press. Washington DC. www.nap.edu

MED-715 [Essential- No credit hour]

Journal Club:

Objectives:

1. Describe resources for collection of literature
2. Describe the ways to prepare presentation on a given topic
3. Prepare comprehensive lecture from available resources
4. Critically analyze the published papers with strengths and limitations

Learning Outcome:

Upon completion of Seminars/Workshops etc. the students will be able to:

1. Collect information from the available resources
2. Prepare a presentation on a given topic
3. Deliver a lecture and manage a question-answer session
4. Work as a productive member of a task force

Course Outline:

Critically reviewing the published paper(s) of choice and elaborating in detail the findings described on weekly basis in the research journal club/seminar, critical thinking on the provided research literature, report writing, presentations.

Recommended Activities:

1. Compulsory Journal Clubs
2. Essential Seminars
3. Conferences
4. Workshops

Resources:

1. Internet
2. Libraries
3. Peer Advice

MED-716[Essential- No credit hour]

Teaching Internship:

Objectives:

1. Understand class management and control
2. Know the principles of effective teaching
3. Develop teaching skills and strategies

Learning Outcome:

Upon completion of teaching internship the students will be able to:

1. Manage and control the undergraduate class
2. Apply the principles of effective teaching
3. Professionally groom the teaching skills

Course Outline:

Working and duties, academic and administerial tasks performed by the student in the department and institution as faculty member including taking up of lectures, case based sessions, problem based learning sessions, demonstrations, mentoring of undergraduate students etc.

Resources:

1. Internet
2. Libraries
3. Peer Advice
4. Students feedback

THS-700 & THS-701

Thesis Research Work: [6 Credit hours]

Course Title: GENERAL PATHOLOGY, BASIC MICROBIOLOGY & SPECIAL PATHOLOGY-I

Course Code: PAT-740

Credit Hours: 3

Pre-requisite:

Basic concepts of human anatomy & histology

Cell & medical biology

Objectives:

1. Describe cellular responses to injury and cell death.
2. Describe inflammation, wound healing and repair.
3. Explain thrombosis, embolism, infarction and shock.
4. Classify tumors and explain the characteristics of benign and malignant tumors.
5. Describe the biology of tumor growth and its effect on clinical stage.
6. Describe the scope and different fields of microbiology.
7. Explain bacterial structure and differentiate between eukaryotic and prokaryotic cells
8. Describe the important components of a typical bacterial cell both gram positive and gram negative and their role in vaccines.
9. Classify bacteria according to their shape, arrangement and gram staining,
10. Describe colonization of normal flora
11. Explain the steps of bacterial pathogenesis. Differentiate b/w true pathogen, opportunists and commensals
12. Comprehend bacterial genetics and the significance of DNA transfer in bacteria
13. Describe methods of sterilization and disinfection.
14. Describe basic concepts and scope of Immunology.
15. Describe the principles of applied immunology in relation to hypersensitivity, autoimmunity and immune-deficiency disorders.
16. Describe the etiology, pathogenesis, diagnosis and clinical features of various diseased involving the digestive and hepato-biliary tracts.
17. Describe characteristics of various tumors of the gastro-intestinal and hepato-biliary systems.

18. Explain obstructive and restrictive pulmonary diseases on the basis of their pathogenesis and clinical manifestations.
19. Describe pulmonary infections, primary tumors of the lung and pleura

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend basic knowledge about principles of pathology & phenomena's such as cell injury, inflammation, healing and disorders of circulation.
2. Discuss the characteristics and biology of tumors
3. Describe disorders related to the gastro-intestinal, hepato-biliary and respiratory systems and disorders of the immune system.
4. Basic knowledge of agents of infectious diseases, bacteria, viruses, parasites, fungi and eukaryotic and prokaryotic structure.
5. State the differentiating characteristics of gram positive and gram negative bacteria and its importance in diagnosis and vaccination.
6. Understand the pattern of bacterial growth, aerobic and anaerobic growth, fermentation of sugars products and clinical laboratory tests.
7. Explain various methods of DNA transfer and their significance in drug resistance.
8. Differentiate b/w true pathogen, opportunists and commensals, routes of transmission, toxin production. Koch's postulates.
9. Describe various methods used for sterilization and disinfection and their application in hospitals OTs, laboratories and health care situations.

Course Outline: General concepts of pathology. Terms and definitions. Mechanisms of cell injury. Process of inflammation and wound healing as well as factors influencing them. Knowledge regarding important phenomena such as thrombosis, embolism, shock and hemorrhage. Basic concepts of tumor formation and progression as well as applied oncology. Bacteria compared with other micro-organisms. Structure of bacterial cell, growth & bacterial genetics. Classification of medically important bacteria. Colonization by normal flora. Pathogenesis and disease production in infectious diseases. Sterilization and disinfection. Basic knowledge of the immune system and pathogenesis of immune system disorders. Etiology, pathogenesis, diagnostic and clinical features of diseases related to the gastrointestinal tract, liver/ biliary system and lungs.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- Cotran RS, Kumar V and Collins T. Robbin's Pathologic Basis of Disease (8thed.). Philadelphia: W.B. Saunders. 2010.
- Walter JB and Talbot IC. Walter and Israel's General Pathology (7thed.). New York: Churchill Livingstone. 1996.
- Kumar V, Cotran RS, and Robbins SL. Basic Pathology (8thed.). Philadelphia: W.B. Saunders. 2007.
- Rubin E, Pathology (4thed.) Philadelphia: Lippincott-Raven. 2005
- Harsh Mohan. Textbook of Pathology (6thed.). Jaypee brothers. 2010.
- Jawetz .medical microbiology.25th ed.2010 Lange/McGrawHill
- Levinson W. Microbiology and Immunology: Review. 10th ed. 2009 Lange/TataMcGrawHill
- Michael j pelczar .Microbiology.6th ed. TataMcGraw
- Richard a harvey. Microbiology.lippincotts illustrated review 2nded

Reference Book:

Cotran RS, Kumar V and Collins T. Robbin's Pathologic Basis of Disease (8thed.). Philadelphia: W.B. Saunders. 2010.

Websites:

The internet pathology laboratory for medical education
library.med.utah.edu/WebPath/webpath.html

Course Title: SPECIAL PATHOLOGY-II, SPECIAL BACTERIOLOGY AND MYCOLOGY

Course Code: PAT-741

Credit Hours: 3

Pre-requisite:

Principles of general pathology and basic microbiology

Objectives:

1. Differentiate between nephrotic and nephritic syndromes and describe the etiology and pathogenesis of various renal disorders
2. Classify and describe the epidemiology, morphology and clinical features of tumors of the kidney and urinary bladder.
3. Describe various inflammatory, neoplastic and non-neoplastic lesions of the female genital tract and breast.
4. Describe the etiology, pathogenesis, morphology, diagnosis and clinical course diseases involving prostate gland.
5. Discuss the various inflammatory, non-neoplastic lesions and tumors of endocrine glands.
6. Discuss the risk factors, pathogenesis, clinical presentations and lab diagnosis and complications of ischemic heart disease, hypertension and various vascular disorders.
7. Describe various non-neoplastic and neoplastic lesions of bones and joints with regard to their etiology, pathogenesis and clinical features.
8. Explain the pathogenesis, structural alterations and clinical features of infectious, vascular and space occupying lesions of central nervous system.
9. Describe the morphological and clinical features of inflammatory dermatoses, bullous skin lesions and malignant tumors of skin.
10. Discuss the morphology, virulence properties, pathogenesis, signs and symptoms and lab diagnosis of gram-positive cocci.
11. Discuss the important properties, pathogenesis, clinical findings and lab diagnosis of gram-negative cocci.
12. Discuss medically important spore forming and non-spore forming, aerobic and anaerobic gram positive rods, transmission, and pathogenesis and laboratory diagnosis and preventive treatment.
13. Classify gram negative rods and enterobacteriaceae, their antigenic and metabolic properties, disease production and laboratory diagnosis.
14. Discuss the genus vibrio, campylobacter, helicobacter pylori, its transmission epidemiology, clinical findings and lab diagnosis.
15. Discuss enteric gram-negative rods with pathogenesis outside the enteric tract and non-enteric gram-negative rods causing respiratory and zoonotic infections.
16. Classify acid-fast bacilli, important properties, transmission and epidemiology, pathogenesis, immunity and hypersensitivity to these organisms, clinical findings, laboratory diagnosis and prevention.
17. Discuss filamentous bacteria, Actinomycetes their important properties disease production and lab diagnosis.
18. Discuss the various species of the genus mycoplasma their pathogenesis and lab diagnosis

19. Discuss the three genera of spirochetes causing human disease, their transmission epidemiology and laboratory diagnosis.
20. Discuss the intracellular group of bacteria, chlamydia and rickettsiae their important properties, and modes of transmission, pathogenesis, lab diagnosis and clinical findings and minor bacterial pathogens
21. Structure and growth of fungi (yeast and molds), fungal toxins pathogenesis and lab diagnosis of fungi (microscopy, culture and molecular methods). Cutaneous and sub-cutaneous mycoses.
22. Pathogenesis and epidemiology of Systemic and opportunistic mycoses.

ELECTIVES DESCRIPTION

TISSUE PROCESSING

Course code PAT-742

Credit Hours 3

Prerequisite

Basic knowledge of human anatomy and histology

Objectives:

Identify the tissue at cellular level

1. Identify the tissue at the cellular level
2. Discuss the process of tissue preparation used for light microscopy
3. Identify the fixatives used for tissue preservation
4. Demonstrate tissue processing techniques
5. Perform the process of paraffin embedding
6. Identify the different types of tissue sectioning
7. Demonstrate the process of tissue sectioning
8. Execute the process of dehydration and clearing
9. Discuss the chemical basis of staining
10. Identify basic histological staining
11. Perform different kinds of tissue staining

Course Learning Outcomes (CLOs)

Upon completion of the course, the student would be able to:

1. Perform tissue preservation, processing and microtomy
2. Describe tissue processing techniques
3. Perform the process of tissue sectioning on microtome
4. Perform histological staining
5. Observe tissue at cellular level

Course Outline

- Fixation of tissues: Phenomenon, Common fixatives used or available: composition advantages and disadvantages. Clearing agents; Paraffin Embedding process; Sectioning Process: Microtomes and knives, their types and uses, Sharpening of knives, Problems encountered and their remedies.
- Staining: Procedure, uses and interpretation of: Routine Haematoxylin and Eosin, special and latest histological techniques.
- Mounting; Vital and supravital dyes and study of cells; Freezing microtome and frozen sectioning.

Resources

Recommended Books:

1. Junqueira LC, Carneiro J. Basic histology. California, U.S.A, Lange Medical publication.
2. Kelly, D.E, Wood, R.L, Enders, A.C. Bailey's Text Book of Microscopic Anatomy. Baltimore, U.S.A, Williams and Wilkins.
3. Burkitt HG, Young B, Heath JW. Wheater's Functional histology London, Churchill living stone.
4. Faustett, D.W.A Text Book of Histology. London, Chapman and hall..

HISTOPATHOLOGY LABORATORY – PROCEDURES & REPORTING

Course Code MED-708

Credit Hours: 3

Principles of general pathology and organ system diseases.

Prerequisite

Principles of general pathology and organ system diseases

Objectives:

1. Demonstrate methods and application of different tissue stains.
2. Characterize different types of tissue sections
3. Explain the importance of immune-stains in the diagnosis of tumors.
4. Identify and describe the morphological features of precancerous lesions and oral cancer.
5. Describe the morphological features of salivary gland tumors.
6. Diagnose and discuss the histology of the diseases and tumors of stomach, intestines and colon.
7. Demonstrate characteristics of diseases and tumors of the hepato-biliary systems.
8. Identify histological characteristics of pulmonary diseases and tumors.
9. Describe the morphology of diseases involving female and male genital tracts
10. Illustrate the differential diagnosis of breast lump.
11. Characterize vasculitis and vascular neoplasms.
12. Diagnose various non-neoplastic and neoplastic lesions of bones and joints .
13. Demonstrate laboratory skills to appreciate the morphology and structural alterations seen in diseases of CNS & peripheral nervous system.
14. Identify and explain the morphological features of inflammatory dermatoses, bullous skin lesions and malignant tumors of skin.

Course Learning Outcomes (CLOs): Upon completion of course the students will be able to appreciate different tissue sectioning methods and staining protocols and their usage in diagnosis of organ system diseases. Identify and describe the characteristics of non-neoplastic and neoplastic diseases of oral cavity, gastrointestinal tract, liver and biliary tract, respiratory system, genital tract, female breast, musculo-skeletal system, central and peripheral nervous system and skin.

Course Outline: Tissue sectioning and staining protocols. Morphology of oral cavity lesions. Morphology of gastrointestinal tract diseases. Morphology of liver and biliary tract disorders. Morphology of respiratory system diseases. Morphology of uro-genital tract lesions. Morphology of endocrine gland diseases. Morphology of female breast lesions. Morphology of musculo-skeletal diseases. Morphology of central and peripheral nervous system disorders. Morphology of skin diseases.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- Rosai& Ackerman's Surgical Pathology, 9thed.
- Anderson's Pathology, 10thed.
- Cotran RS, Kumar V and Collins T. Robbin's Pathologic Basis of Disease (8thed.). Philadelphia: W.B. Saunders. 2010.
- Walter JB and Talbot IC. Walter and Israel's General Pathology (7thed.). New York: Churchill Livingstone. 1996.
- Rubin E, Pathology (4thed.) Philadelphia: Lippincott-Raven. 2005
- Harsh Mohan. Textbook of Pathology (6thed.). Jaypee brothers. 2010.

Reference Book:

- Rosai& Ackerman's Surgical Pathology, 9thed.

Websites:

- The internet pathology laboratory for medical education, library.med.utah.edu/WebPath/webpath.html

ENDOCRINE & RENAL DISORDERS

Course Code PAT-744

Credit Hours: 3

Objectives:

1. Comprehend basic knowledge of diagnosis and screening for renal diseases
2. Describe the role of electrolytes in kidney diseases
3. Explain the nature and composition of specimen for electrolyte determination.
4. Demonstrate sample collection for Renal function tests.
5. Interpret plasma & urine abnormalities in renal disorders
6. Interpret laboratory evaluation of various Renal disorders.
7. Comprehend basic knowledge of major endocrine glands and their function
8. Describe and interpret the role of hormones, their composition and action
9. Interpret laboratory evaluation of various endocrinopathies
10. Describe the role of laboratory in reproductive endocrinology.
11. Comprehend the hormonal changes related to disorders of reproductive endocrinology

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend the role of chemical pathology tests in diagnosis of diseases.
2. Demonstrate the use of laboratory in the diagnosis of various endocrine disorders.
3. Interpret electrolyte abnormalities in renal diseases.
4. Describe various serum electrolytes normal and abnormal values and their role in differential diagnosis.

Course Outline: The course contents of this subject include; Kidney-electrolytes. Diagnosis and screening for renal diseases. Specimens for electrolytes determination. Plasma and urine abnormality. Interpretation of electrolytes in diseases of Endocrines, Hypothalamus and pituitary, Adrenal cortex, Thyroid function and Reproductive system.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Teit's Text Book of Clinical Chemistry Latest Ed.
2. Clinical Chemistry in Diagnosis and Management by Zelwa Latest Ed.
3. Clinical Chemistry (Illustrated) by Marshall Latest Ed.

Journals:

1. The Journal of Biochemistry
2. Journal of Clinical Pathology
3. Nature Reviews Endocrinology
4. Molecular and Cellular Endocrinology
5. Experimental and Molecular Pathology

Course Title: MOLECULAR PATHOLOGY LABORATORY- RELATED TO TISSUE PATHOLOGY

Course Code: PAT-745

Credit Hours: 3

Objectives:

1. To develop basic understanding of molecular pathology
2. To demonstrate laboratory safety and management techniques in a safe and prudent manner using established guidelines.
3. To understand concept of biosafety levels with respect to molecular pathology.
4. To demonstrate tissue handling for DNA/RNA extraction and preservation
5. To develop experimental skills related to polymerase chain reaction
6. To demonstrate molecular techniques related to tissue pathology
7. To discuss the role of molecular pathology in the diagnosis of cancer and other malignancies
8. To understand processes like Apoptosis and Cell Senescence.

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Basics of Molecular Pathology
2. Molecular Techniques and Lab Methods related to tissue pathology
3. Lab Management

Course Outline:

Understanding of control of cell cycle, cell proliferation and death, Malignancy, Genetic repair mechanisms, Molecular mechanisms of oncogenesis, Molecular basis for the known risk factors for tumours, such as viral carcinogenesis and environmental carcinogens, familial cancer and its molecular basis, tumour growth, angiogenesis, tissue invasion and metastasis, tumour classification systems, Role of pathology in cancer diagnosis, molecular sub-classification, assessment of aggressiveness (prognosis), and characterization of metastases, Molecular Techniques and Lab Methods, Quality Assurance and Lab Regulation and Lab Management.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- 1) Cell and Molecular Biology: Concepts and Experiments, 4th ed., Gerald Karp, Wiley, 2005
- 2) Essential Concepts in Molecular Pathology (Hardcover) by William B. Coleman, Gregory J. Tsongalis, Academic Press

- 3) Molecular Pathology: The Molecular Basis of Human Disease, William B. Coleman, Gregory J. Tsongalis Academic Press.
- 4) Basic Concepts of Molecular Pathology Editors: Cagle, Philip T., Allen, Timothy Craig .Springer Publisher
- 5) Molecular Pathology in Clinical Practice edited by Debra G.B. Leonard. Springer Publisher.
- 6) Molecular Pathology Methods Ed. Megan J. Smith-Zagone, Joseph F. Pulliam Daniel H. Farkas.

Course Title: MICROBIOLOGY LABORATORY - PROCEDURES & REPORTING

Course Code: PAT-746

Credit Hours: 3

Pre-requisite:

Basic concepts of infectious diseases caused by bacteria.

Objectives:

1. Understand the general rules of conduct in the laboratory.
2. Familiarize with Laboratory equipment and use and care of microscope.
3. Perform Basic laboratory procedures (sterilization and disinfection, hot air oven, autoclave, filtration, inoculation, incubation)
4. Knowledge of Indenting and storage of reagents and culture media.
5. Knowledge of Collection, transport, storage and disposal of specimens.
6. Identify Gram-positivecoccoi (by using microscopy staining, growth on selective media, biochemical reactions serology, molecular methods and antibiotic sensitivity pattern)
7. Identify of Gram negativecoccoi (by using staining microscopy, growth on selective media, biochemical reactions , serology, molecular methods and antibiotic sensitivity pattern)
8. Identify of Gam positive bacilli (by using microscopy staining, growth on selective media, biochemical reactions, serology, molecular methods and antibiotic sensitivity pattern)
9. Identify Gram negative bacilli (by using microscopy, staining, ,growth on selective media, biochemical reactions, serology, molecular methods and antibiotic sensitivity pattern)
10. Identify Spirochetes and perform serologic tests of syphilis.
11. Demonstrate essential skills to diagnose Mycobacteria by (acid-fast staining, culture, molecular methods)
12. Identify Mycoplasma organisms by serologic methods.
13. Demonstrate essential skills to diagnose Chlamydia, Rickettsia organisms by serology.

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to Have a complete knowledge of microbiology laboratory procedures, check the specimen, request form and labeling. Storage of specimen .Waste disposal and reporting. Standard procedures of sterilization Microscopic examination (staining procedures used in the lab, gram staining, Ziehl-Neelsen staining) If specimen is for culture he should know preparation of culture media (selection of media and their incubation aerobic and anaerobic). Use of biochemical tests in bacterial identification. Antimicrobial sensitivity testing.

Course Outline: General rules of conduct in the laboratory. Laboratory equipment and microscope. Sterilization and disinfection, hot air oven, autoclave, filtration, inoculation, incubation. Computers in laboratory. Indenting and storage of reagents and culture media. Hazards in laboratory and safety precautions.

Quality control. Collection, transport, storage and disposal of specimens.

Identification of Gram-positive cocci, Gram negative cocci, Gram positive bacilli, Gram negative bacilli, Spirochetes, Mycobacteria, Mycoplasma, Chlamydia, Rickettsia.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- 1) Cell and Molecular Biology: Concepts and Experiments, 4th ed., Gerald Karp, Wiley, 2005
- 2) Essential Concepts in Molecular Pathology (Hardcover) by William B. Coleman, Gregory J. Tsongalis, Academic Press
- 3) Molecular Pathology: The Molecular Basis of Human Disease, William B. Coleman, Gregory J. Tsongalis Academic Press.
- 4) Basic Concepts of Molecular Pathology Editors: Cagle, Philip T., Allen, Timothy Craig .Springer Publisher
- 5) Molecular Pathology in Clinical Practice edited by Debra G.B. Leonard. Springer Publisher
- 6) Molecular Pathology Methods Ed. Megan J. Smith-Zagone, Joseph F. PulliamDaniel H. Farkas.

Course Title: MOLECULAR PATHOLOGY LABORATORY- RELATED TO INFECTIOUS DISEASES

Course Code: PAT-747

Credit Hours: 3

Pre-requisite:

Bones of axial and appendicular skeleton

Gross and microscopic features of skeletal muscles

Objectives:

1. To develop basic understanding of molecular pathology
2. To demonstrate laboratory safety and management techniques in a safe and prudent manner using established guidelines.
3. To understand concept of biosafety levels with respect to molecular pathology.
4. To demonstrate essential skills for DNA/RNA extraction and preservation for various samples of infectious diseases
5. To develop experimental skills related to polymerase chain reaction
6. To demonstrate molecular techniques related to the diagnosis of infectious diseases.
7. To discuss the role of molecular pathology in the diagnosis of infectious diseases

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Basics of Molecular Pathology
2. Molecular Techniques and Lab Methods related to infectious agents
3. Lab Management

Course Outline: Understanding of molecular mechanisms of different etiological agents responsible for infectious diseases like tuberculosis, hepatitis, HIV infection etc. Molecular basis for the viral carcinogenesis Role of pathology in molecular sub-classification, assessment of prognosis, and characterization of viral diseases. Molecular Techniques and Lab Methods, Quality Assurance and Lab Regulation and Lab Management.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- 1) Cell and Molecular Biology: Concepts and Experiments, 4th ed., Gerald Karp, Wiley, 2005
- 2) Essential Concepts in Molecular Pathology (Hardcover) by William B. Coleman, Gregory J. Tsongalis, Academic Press
- 3) Molecular Pathology: The Molecular Basis of Human Disease, William B. Coleman, Gregory J. Tsongalis Academic Press.
- 4) Basic Concepts of Molecular Pathology Editors: Cagle, Philip T., Allen, Timothy Craig .Springer Publisher
- 5) Molecular Pathology in Clinical Practice edited by Debra G.B. Leonard. Springer Publisher
- 6) Molecular Pathology Methods Ed. Megan J. Smith-Zagone, Joseph F. Pulliam Daniel H. Farkas

Course Title: VIROLOGY

Course Code: PAT-748

Credit Hours: 3

Pre-requisite:

Basic microbiology

Objectives:

- 1) Describe the basic structure of viruses .
- 2) Classify viruses and discuss general characteristics of viruses with relation to their host
- 3) Explain the structure, pathogenesis, diagnosis and immunization of influenza virus
- 4) Describe the pathogenesis and laboratory investigation of Viral Hepatitis.
- 5) Distinguish between different type of Hepatitis: Hepatitis A, B, C and E
- 6) Interpret the viral markers of hepatitis.
- 7) Describe morphological structure and pathogenesis of human immunodeficiency virus
- 8) Classify Herpes viruses family and discuss the pathogenesis and clinical feature of herpes simplex type1 and type2
- 9) Describe the pathogenesis, clinical finding and investigation of Arthropod born viral infection.
- 10) Discuss the pathogenesis and immunization of paramyxovirus
- 11) Discuss the pathogenesis and immunization of rubella virus.
- 12) Describe the pathogenesis, clinical finding and investigation of picorna virus.
- 13) Describe the pathogenesis, clinical findings, investigation and immunization of rabies virus.
- 14) Discuss the pathogenesis and immunization of adenovirus,
- 15) Discuss the pathogenesis and immunization of Rota virus.
- 16) Discuss the pathogenesis and immunization of Reo virus
- 17) Discuss the pathogenesis of cancer causing viruses

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Perform laboratory tests related to the diagnosis of viral diseases.
2. Describe the pathogenesis, clinical and morphological features of different viruses and identify these in various human samples.

Course Outline: The course addresses the structure, function and classification of viruses. Special emphasis will be given to the understanding of pathogenesis, techniques and protocols to diagnose different viral infections. The course is also planned to provide a comprehensive knowledge of Hepatitis, HIVs and other important viruses as well as various precautionary measures for protection against viral infections.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- 1. Jawetz .medical microbiology.25th ed.2010 Lange/McGrawHill
- Levinson W. Microbiology and Immunology: Review. 10th ed. 2009 Lange/TataMcGrawHill
- Michael j pelczar .Microbiology.6th ed. TataMcGraw
- Robins and Cotran Pathologic basis of disease

Websites:

- The internet pathology laboratory for medical education
- library.med.utah.edu/WebPath/webpath.html
- www.asm.org

Course Title: **PARASITOLOGY**

Course Code: PAT-749

Credit Hours: 3

Pre-requisite: Basic microbiology

Objectives:

1. Define parasite and classification of parasites
2. Describe the life cycle of Giardia Lamblia
3. Identify the morphological features of giardia for lab diagnosis
4. Describe the lifecycle of entamoebahistolytica
5. Identify the morphological features of entamoebahistolytica for lab diagnosis
6. Describe life cycle of plasmodium
7. Demonstrate lab skills for the diagnosis of plasmodium species
8. Identify the morphological features of Ascaris
9. Describe the pathogenesis of Ascariasis
10. Identify the morphological differences between *taeniasolium* and *saginatascolex*
11. Identify the morphological difference between *Taeniasolium* and *T.Saginata* proglottids
12. Describe the disease taeniasis regards to its pathogenesis, clinical course and diagnosis.
13. Describe the life cycle of Echinococcus and demonstrate the lab skills for its diagnosis
14. Demonstrate the laboratory procedures and their interpretation for Schistosoma and *Leishmania*.
15. Discuss the lab diagnosis of *Toxoplasma*.
16. Discuss the life cycle and pathogenesis of intestinal and tissue nematodes in relation to their diagnosis.

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

- Perform laboratory tests related to the diagnosis of parasitic diseases.
- Describe the pathogenesis, clinical and morphological features of different parasites and identify these in various human samples

Course Outline: The course will also encompass basic knowledge of parasitology . protozoa, cestodes, nematodes and related infestations will be addressed in detail.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

- Jawetz .medical microbiology.25th ed.2010 Lange/McGrawHill
- Levinson W. Microbiology and Immunology: Review. 10th ed. 2009 Lange/TataMcGrawHill
- Michael j pelczar .Microbiology.6th ed. TataMcGraw
- Robins and Cotran Pathologic basis of disease

Websites:

- The internet pathology laboratory for medical education
- library.med.utah.edu/WebPath/webpath.html
- www.asm.org

3. MPHIL PHARMACOLOGY**STRUCTURE:**

Course title	MPhil • Pharmacology
Course duration	2years (max 3 years)
Study system	Semester System
No. of regular semesters	4
Semester Duration	16weeks teaching+ 2 weeks examination
Total credit hours	30 credit hrs (24 credit hr. of course work + 6 credit hours research)
Credit hour distribution	Semester I= 9 Semester II= 9 Semester III=9 Semester IV=3

MPHIL -PHARMACOLOGY – ROADMAP**SEMESTER- 1**

Course Code	Course Title	Credit Hours
MED-701	Research Methodology	3+0
MED-712	Medical Biology & Genetics	2+0
MED-713	Medical Education, Ethics & Writing	2+0
MED-714	Instruments and Animal use in research	1+1
MED-715	Journal Club	No credit hour
MED-716	Teaching Internship	No credit hour
	Total	09

SEMESTER- 2

Course Code	Course Title	Credit Hours
PHM-721	Pharmacological concepts & Adrenergic Pharmacology	2+1
PHM-722	Cholinergic & Cardio Respiratory Pharmacology	3+0
	E EI Elective -I	3+0
MED-715	Journal Club	No credit hour
MED-716	Teaching Internship	No credit hour
	Total	09

SEMESTER -3

Course Code	Course Title	Credit Hours
	Elective-II	3+0
	Elective-III	3+0
THS-701	Thesis	3
MED-715	Journal Club	No credit hour
MED-716	Teaching Internship	No credit hour
	Total	09

SEMESTER- 4

Course Code	Course Title	Credit Hours
THS-701	Thesis	3
	Total	3
	TOTAL CREDIT HOURS	30

CORE COURSES

S. No	Course Code	Course Title	Credit Hours
1	MED-712	Medical Biology & Genetics	2+0
2	MED-713	Medical Education, Ethics & Writing	2+0
3	MED-714	Instruments and Animal use in research	1+1
4	PHM-721	Pharmacological concepts & Adrenergic Pharmacology	2+1
5	PHM-722	Cholinergic & Cardio Respiratory Pharmacology	3+0
6	THS-700	Thesis	3
7	THS-700	Thesis	3
8	MED-715	Journal Club	No credit hour
9	MED-716	Teaching Internship	No credit hour
1	MED-706	Tissue Processing	2+1
2	MED-707	Drug Bio-screening & Herbal Medications	2+1
3.	PHM-723	Neuropharmacology	3+0
4	PHM-724	Endocrine & Gastrointestinal Pharmacology	3+0
5	PHM-725	Chemotherapy	3+0
6	PHM-726	Toxicology	3+0
7	PHM-727	Pharmacogenetics	3+0
8	PHM-728	Autacoids & Analgesics	3+0
9	PHM-729	Age specific Pharmacotherapy	3+0
10	PHM-730	Dental Pharmacology	3+0

UNIVERSITY REQUIREMENT

Sr. No	Course Code	Course Title	Credit Hours
1	MED-701	Research Methodology	3+0

CORE COURSES**MED-701 [3+0 Credit hours]****RESEARCH METHODOLOGY , BIOSTATISTICS, EPIDEMIOLOGY:****Objectives:**

1. Describe research, research methods, research studies, their designs and work feasibility
2. Describe types of data and ways of collection of data
3. Comprehend organization, categorization and analyses of collected data
4. Describe the fundamental concepts and methods of statistics in the areas of medical research
5. Demonstrate use of statistical computer software for data analysis
6. Explain the concepts and methods of epidemiology in the areas of medical research
7. Describe advantages and disadvantages of epidemiological studies

Learning Outcome:

Upon completion of course the students will be able to:

1. Acquire the basic knowledge of research, research studies, their designs and work feasibility
2. Organize, categorize and analyze the collected data
3. Apply fundamental concepts and methods of statistics in the areas of medical and biological research
4. Use of statistical computer software for data analysis

5. Apply fundamental concepts and methods of epidemiology in the areas of medical and biological research
6. Describe advantages and disadvantages of epidemiological studies

Course Outline:

Research and experimental/ study design, selection of topic, formulation of objectives ,work plan, sampling, data collection, questionnaire and surveys, statistical interpretation of the results, introduction to biostatistics, application of statistics in medical sciences, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram, preparations, measures of central tendency and dispersion, sampling techniques and sample size calculation, types of biological data, simple random sampling, sampling distribution and standard error, stratified random sampling, systematic and cluster sampling, statistical hypothesis, level of significance, test of significance, confidence interval, test involving binomial and normal distribution, chi-square distribution, its properties and application, properties of t-distribution and f-distribution, test of significance based on t-distribution and f- distribution, one-way classification, partitioning of sum of squares and degree of freedom; two-way classification, multiple comparison test; the analysis of variance models, basic principle of experimental designs, randomization, practical information on the use of database systems and software tools for data management and analysis, introduction to epidemiology, its uses, person, time, epidemics and types of epidemics, measures of disease frequency, morbidity and mortality rates, incidence, prevalence, cumulative incidence, incidence density, sensitivity and specificity, bias types, important study designs, sources of errors in epidemiologic studies, epidemiologic models.

Recommended Readings:

1. Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.
2. Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
3. Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford University Press, Latest Ed.
4. Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods. Belmont, CA: Lifetime Learning Publications, Latest Ed.
5. Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
6. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons. Inc. New York.
7. Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications. New Jersey USA.
8. Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, New Jersey USA.
9. Statistical Software: SPSS; EPIINFO; STATA; SAS

MED-712 [2+0 Credit hours]**MEDICAL BIOLOGY & GENETICS:****Objectives:**

1. Describe cell structure and organization
2. Comprehend DNA replication, transcription, protein synthesis and enzymology
3. Know molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Describe molecular cloning and molecular tools for studying genes and gene activity
5. Describe DNA structure and function
6. Understand language of genetics and the terminology of molecular biology

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of cell structure and organization
2. Explain DNA replication, transcription, protein synthesis and enzymology
3. Explain molecular genetics like DNA recombination, gene structure, function and regulation as well as cell signaling pathways and cancer
4. Comprehend molecular cloning and molecular tools for studying genes and gene activity
5. Comprehend basic knowledge in the DNA structure and function
6. Explain the language of genetics and the terminology of molecular biology

Course Outline:

Overview of cell biology, the structure and function of biological macromolecules such as proteins, RNA, and DNA, signal transduction, and basic genetic mechanisms, broad overview of gene expression, nuclear organization and nucleic acid metabolism, gene transcription, chromatin structure and epigenetics, telomere biology, DNA replication and recombination, synthesis and folding of functional proteins, and RNA processing, stem cells, cytoskeletal dynamics, cell cycle, apoptosis, and protein transport, molecular mechanisms underlying key biological processes, membrane transport, signal transduction, immune recognition, molecular motors, gene expression, enzyme catalysis, ribozymes/riboswitches, structure determination, and structure-based design, role of atypical post-translational modifications of proteins in governing human health and disease, ubiquitin and ubiquitin-like modifiers, proline hydroxylation, histone modifications, protein oxidation, impact of modifications on cellular metabolism, apoptosis, autophagy, bacterial and viral infections, memory, neuro-pathology, human cancers, fundamentals of genetics, comprehension of the language of genetics and the terminology of molecular biology, role of genetics in diseases and disorders, screening and diagnostic technologies in genetic diseases, gene therapy and genetic counseling, transmission genetics, principles and methods of genetic analysis, gene interactions, mapping, mutagenesis, clonal analysis, transgenic studies, use of mosaics, epigenetics and methods of study in human genetics, proteomics, genomics.

Recommended Readings:

1. Karp, Gerald. Cell and Molecular Biology: Concepts and Experiments with Student Study Guide John Wiley & Sons, Latest Ed.
2. David S. Latchman. Basic Molecular and Cell Biology Wiley Blackwell, Latest Ed.
3. Stephen L. Wolfe. Introduction to Cell and Molecular Biology. Wiley Blackwell, Latest Ed.
4. Lizabeth A. Allison. Fundamental Molecular Biology. Wiley Blackwell, Latest Ed.
5. Hart, D. L. and E. W. Jones. Essential Genetics: A Genomics Perspective. Sudbury, MA: Jones and Bartlett Publishers, Latest Ed.
6. Benjamin Pierce. Genetics. W. H. Freeman, Latest Ed.
7. Jeremy W. Dale, Malcolm van Schantz. From Gene to Genome. John Wiley & Sons Ltd, Latest Ed.
8. A Miches. Genetic Techniques for Biological Research. John Wiley & Sons Ltd, Latest Ed.
9. Leland Hartwell, Leroy Hood, Micheal Goldberg, Ann Reynolds, Lee Silver, Ruth Veres. Genetics: From Genes to Genomes. McGra-Hill Science, Latest Ed.

MED- 713 [2+0 Credit hours]

MEDICAL EDUCATION, ETHICS & WRITING:

Objectives:

1. Comprehend principles of module development, adult learning and assessment

2. Apply effective teaching skills including small group & large group learning activities
3. Describe skills of writing test items for knowledge, skills and behavioral objectives
4. Comprehend concepts of bioethics, principles of ethics & related ethical issues in biomedical research
5. Describe the rationale for the use of subjects and animals in research
6. Describe literature search and ways to conduct this search
7. Describe the components and write up of research proposal, thesis, article and grants

Learning Outcome:

Upon completion of course the students will be able to:

1. Demonstrate understanding of the principles of module development, adult learning and assessment
2. Demonstrate effective teaching skills including small group & large group learning activities
3. Demonstrate skills of writing test items for knowledge, skills and behavioral objectives
4. Comprehend the fundamental concepts of Bioethics
5. Apply the principles of ethics in the areas of medical and biological research
6. Understand the rationale for the use of subjects and animals in research
7. Identify the ethical issues related to cloning, genetic & stem cell research
8. Describe literature search and ways to conduct this search
9. Comprehend the parts of synopsis, thesis and grant proposal writing
10. Critically analyze data, design a project and write up of research article
11. Present and communicate research articles/research data in conferences and symposia

Course Outline:

Module development, adult learning, assessment, teaching skills, teaching strategies, framing out of objectives, formulation of BCQ's and SEQ's, Awareness of proper ethical conduct in biomedical research, appropriate techniques for written and oral presentations as well as ethics and standard practices for record keeping, data analysis, and authorship, ethical issues involved in the planning, implementation and completion of clinical research, understanding the rationale for human subject protection, understanding the mission and function of the IRB, understanding the processes and procedures of the IRB, knowledge of the preparation of an IRB application for submission, understanding the regulatory issues and requirements (State, Federal and Institutional) related to clinical and translational research, understanding and compliance with ethical issues involved in the recruitment of research participants including vulnerable populations, understanding the informed consent process, and understanding the ethical and professional issues involved in clinical and translational research, mentoring and collaboration, academia-industry collaboration, controversies in clinical equipoise, issues in global health research and genetic research, intellectual property, ethical issues in genetic research, cloning and stem cell research, authorship in publication of research, data safety and monitoring boards, privacy and confidentiality issues in research, compensation for research-related injury, deception in research, therapeutic misconception, ethics for animals in research, typical components of a research proposal, abstract, problem identification, problem definition and problem justification, goals and objective, research questions and hypothesis, resource requirements, analysis plan, plan for interpretation, dissemination, logistics and work schedule, bibliography, appendices, selecting fund mechanisms, writing individual grant sections and understanding administrative policies, cover letter, proposal narrative, project budget, letters of support, synopsis writing, components of synopsis and thesis writing, component of research article, literature search by different methods, books, Journals, periodicals, use of different websites, search engines writings, e-books, referencing soft ware, plagiarism & language check soft ware.

Recommended Readings:

1. Arifullah: Shahnaz. andBhatti K.M Research process simplified, Peshawar Latest Ed.
2. W.H.O. Training manual on health research methodology Latest Ed.
3. The Psychology of Interpersonal Behaviour (Penguin Psychology) by Michael Argyle
4. Skilled Interpersonal Communication: Research, Theory and Practice, 5th Edition by Owen Hargie
5. The Interpersonal Communication Book by Joseph A. DeVito
6. The Complete Guide to Medical Writing by Mark Stuart and Mark Stuart
7. A-Z of Medical Writing by Tim Albert
8. Medical Writing: A Guide for Clinicians, Educators, and Researchers by Robert B. Taylor

MED- 714 [2(1+1) credit hours]

INSTRUMENTS AND ANIMAL USE IN RESEARCH:

Objectives:

1. Describe the role of technology in biomedical research
2. Explain the principle of instruments used in medical research
3. Explain standard operative procedures (SOP) of common instruments used in medical research
4. Comprehend the need of laboratory animals use in medical research
5. Describe the standard procedures for laboratory animal handling, care, restraining, drug administration, and blood drawing
6. Describe analgesia, anesthesia, euthanasia and Animal Welfare Ordinance for laboratory animals

Learning Outcome:

Upon completion of course the students will be able to:

1. Comprehend the importance of technology in research
2. Explain the principle of instruments used in medical research
3. Identify the need and commonly used laboratory animals
4. Describe the basic concepts of laboratory animal handling, care and Animal Welfare Ordinance
5. Demonstrate the techniques of animal restraining, drug administration, blood drawing
6. Comprehend the techniques of analgesia, anesthesia and euthanasia in laboratory animals

Course Outline:

Centrifuge machines, different type of microscopes, spectroscope, chromatography, Power lab system, hot plate, analgesia meter, microtome, oven, ECG machine, pH meter, electronic balance, PCR, HPLC, electrophoresis, in- vitro & vivo methods of drug screening, high performance liquid chromatography, handling experimental animals in the laboratory, the type of animal, looking after these experimental animals, handling animals gently, following the guidelines of ethical consideration for animal use, genetic quality, strain / stock breeding system ,quality breeder / supplier, sex, age, body weight, health status of animals, hygiene barrier in maintenance, nutrition, quality drinking water, maintenance, cage, type (dimensions), bedding, number of animals per cage, animal room, ventilation, temperature, relative humidity, lighting ,noise ,other animals ,transportation ,means of transportation ,transport cage ,food supply animals care, experimental techniques, standardization of techniques, time of intervention, animal quarantine, use of defined animals in appropriate conditions, reducing stress on the animals, generating reproducible and reliable results, biological characteristics and husbandry requirements of the species, animal welfare, use of animals for teaching, research and testing, administration of drugs through oral and par-enteral routes, blood collection from tail vein and cardiac puncture, oral feeding, Sexing, reducing pain and distress, anesthesia, euthanasia.

Recommended Readings:

1. Biochemical Methods: A Concise Guide for Students and Researchers (Life Sciences). Latest edition
2. Guide for the care and use of laboratory animals . 8th edition. National Academies press. Washington DC.www.nap.edu

MED-715 [Essential- No credit hour]

Journal Club:

Objectives:

1. Describe resources for collection of literature
2. Describe the ways to prepare presentation on a given topic
3. Prepare comprehensive lecture from available resources
4. Critically analyze the published papers with strengths and limitations

Learning Outcome:

Upon completion of Seminars/Workshops etc. the students will be able to:

1. Collect information from the available resources
2. Prepare a presentation on a given topic
3. Deliver a lecture and manage a question-answer session
4. Work as a productive member of a task force

Course Outline:

Critically reviewing the published paper(s) of choice and elaborating in detail the findings described on weekly basis in the research journal club/seminar, critical thinking on the provided research literature, report writing, presentations.

Recommended Activities:

1. Compulsory Journal Clubs
2. Essential Seminars
3. Conferences
4. Workshops

Resources:

1. Internet
2. Libraries
3. Peer Advice

MED-716[Essential- No credit hour]

Teaching Internship:

Objectives:

1. Understand class management and control
2. Know the principles of effective teaching
3. Develop teaching skills and strategies

Learning Outcome:

Upon completion of teaching internship the students will be able to:

1. Manage and control the undergraduate class
2. Apply the principles of effective teaching
3. Professionally groom the teaching skills

Course Outline:

Working and duties, academic and administerial tasks performed by the student in the department and institution as faculty member including taking up of lectures, case based sessions, problem based learning sessions, demonstrations, mentoring of undergraduate students etc.

Resources:

1. Internet
2. Libraries
3. Peer Advice
4. Students feedback

THS-700 & THS-701

Thesis Research Work: [6 Credit hours]

Course Title: PHARMACOLOGICAL CONCEPTS & ADRENERGIC PHARMACOLOGY

Course Code: PHM-721

Credit Hours: 3 (2+1)

Pre requisite:

1. Medical biology
2. Organization of autonomic nervous system

Objectives:

1. Describe the scope of Pharmacology
2. Explain the sources of drugs, dosage forms and routes
3. Describe the foundations of rational use of drugs
4. Describe the principles of various pharmacokinetic parameters
5. Describe factors modifying drug absorption, distribution, metabolism, excretion
6. Describe the mechanisms by which drugs exert their effects
7. Explain competitive, non-competitive, functional and allosteric antagonists
8. Describe dose response curves and their applications
9. Describe various types of adverse drug reactions
10. Describe the pre-clinical and clinical trials of drug development
11. Comprehend adrenoceptors and drugs activating them
12. Describe the pharmacokinetics, clinical uses, contraindications, adverse effects and toxicity of adrenoceptor activators
13. Describe the pharmacokinetics and pharmacodynamics of adrenoceptor blocking drugs

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of principles of pharmacology, drugs nomenclature, divisions of Pharmacology, pharmacopoeias, routes of administration
2. Discuss the types of adverse drug reactions and outline the process of drug development, approval and clinical trials

3. Characterize major neuronal systems in ANS and describe ways in which neuronal system may be altered by disease and drugs
4. Explain Pharmacology of adrenergic agonists and antagonists

Course Outline:

General concepts of pharmacological agents and substances, sources and route of drug administration, pharmacokinetics, absorption, distribution, metabolism, excretion of drugs, pharmacodynamics, receptors, receptor interactions, agonist, antagonist, trans-membrane signaling, receptor binding, antagonism and its types, receptor diseases, dose response curve, dosing and the time course of drug action, rational use of drugs, drug regulation.

Neurohumoral transmission, autonomic and somatic motor nervous system, adrenergic drugs, catecholamines, non-catecholamines, adrenergic receptor blocking drugs, ergot alkaloids, adrenergic neuron blocking drugs, drugs acting on neuromuscular junction and autonomic ganglia.

Resources:**Recommended Books:**

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Sixteen Week Lesson Plan:

<u>Week No</u>	<u>Course Contents</u>
Week 1	Scope of Pharmacology, sources, dosage forms
Week 2	Routes of administration of drugs ,rational use of drugs
Week 3	Principles of various pharmacokinetic parameters, factors modifying drug absorption and distribution. Quiz -1
Week 4	Factors modifying metabolism and excretion of drugs. Assignment-1
Week 5	Mechanisms of action of drugs, ligands and their types
Week 6	Competitive, non-competitive, functional and allosteric antagonists, Dose response curves, their applications. Quiz-2
Week 7	Adverse drug reactions ,pre-clinical & clinical trials of drug development
Week 8	Neuro-chemical transmission in ANS & ways in which neuronal system is altered by diseases and drugs
Week 9	Mid-Term
Week 10	Pharmacokinetics of adrenoceptor activators
Week 11	Pharmacodynamics of adrenoceptor activating drugs-1
Week 12	Pharmacodynamics of adrenoceptor activating drugs-2. Quiz-3
Week 13	Pharmacokinetics of adrenoceptor blocking drugs. Assignment-2
Week 14	Pharmacodynamics of adrenoceptor blocking drugs-1
Week 15	Pharmacodynamics of adrenoceptor blocking drugs-2. Quiz-4
Week 16	Presentation
Week 17	Semester Exam
Week 18	Semester Exam

Course Title: CHOLINERGIC & CARDIO -RESPIRATORY PHARMACOLOGY

Course Code: PHM-722

Credit Hours: 3+0

Pre requisite: Pharmacological concepts & Adrenergic Pharmacology

Objectives:

1. Describe the pharmacokinetics, clinical uses, contraindications, adverse effects and toxicity of cholinoreceptor activators and blockers
2. Describe the features of cholinesterase inhibiting drug toxicity and measures to treat them
3. Describe the various groups of antihypertensive drugs
4. Explain the common drug-drug interactions of antihypertensive agents
5. Describe the vasodilator drugs with respect to angina pectoris
6. Describe the drugs used in the treatment of heart failure
7. Describe the drugs used in various types of cardiac arrhythmias
8. Describe the pharmacology of hypolipidemic drugs
9. Describe anticoagulant,thrombolytic, anti-platelet and coagulant drugs
10. Describe the importance of hematologic drugs
11. Describe the pharmacokinetics and dynamics of NSAIDS
12. Describe the drug treatment of arthritis (RA, OA and gout)
13. Describe the mechanism of action and clinical uses of immunosuppressant and immunomodulator drugs
14. Describe the pharmacokinetics and pharmacodynamics of glucocorticoids
15. Describe the pharmacology of opioid analgesic drugs and their antagonists
16. Describe the role of vasoactive peptides
17. Describe pharmacokinetics and dynamics of drugs used in treatment of Asthma
18. Describe the pharmacology of drugs used for the treatment of cough

Course Learning Outcomes (CLOs):

Upon completion of the course the student will be able to:

1. Describe the Pharmacology of cholinergic agonists and antagonists
2. Comprehend pharmacokinetic knowledge of drugs used for treatment of diseases and complications of kidney, cardiovascular, blood, immune and respiratory systems
3. Comprehend the mechanism of action, adverse effects and toxicities of drugs acting on kidney, cardiovascular , blood, immune and respiratory system

Course Outline:

Types of cholinergic receptors and their role, cholinergic agonists, choline esters and natural alkaloids, anticholinesterases, antimuscarinics, natural alkaloids as atropine & hyoscine, semi-synthetic anticholinergic drugs, antihypertensive drugs, cardiac glycosides and treatment of cardiac failure, anti-anginal drugs, anti-arrhythmic drugs, lipid lowering drugs, diuretics as carbonic anhydrase inhibitors, thiazide diuretics, loop diuretics, K+ sparing and osmotic diuretics, anti-diuretic agents, anti-coagulants-parenteral and oral, hematins, anti-platelets and fibrinolitics, NSAIDS, opioid analgesics, immune-suppressives and immuno-modulators, drugs used for treatment of osteo-arthritis, rheumatoid arthritis and gout, histamine, bradykinin, 5-hydroxy-tryptamine, ergot alkaloids and their antagonists, migraine, eicosanoids and prostaglandins, drugs used in the treatment of bronchial asthma, expectorants, mucolytics, antitussives.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Sixteen Week Lesson Plan:

<u>Week No</u>	<u>Course Contents</u>
Week 1	Pharmacokinetics, clinical uses, contraindications, adverse effects and toxicity of cholinceptor activators and blockers
Week 2	Cholinesterase inhibiting drugs toxicity and measures for their treatment
Week 3	Antihypertensive drugs and their drug-drug interactions Quiz-1
Week 4	Anti-anginal agents and drugs used in CCF. Assignment-1
Week 5	Anti-arrhythmic drugs
Week 6	Hypolipidemic drugs. Quiz-2
Week 7	Anticoagulant and coagulant drugs
Week 8	Heamatinic drugs
Week 9	Mid-Term
Week 10	Pharmacokinetics and dynamics of NSAIDS
Week 11	Drug treatment of arthritis
Week 12	Immunosuppressant and immunomodulator drugs. Quiz-3
Week 13	Pharmacology of glucocorticoids, Opioid analgesics and their antagonists. Assignment-2
Week 14	Vasoactive peptides and antitussive drugs.
Week 15	Anti-asthmatic drugs. Quiz-4
Week 16	Presentations
Week 17	Semester Exam
Week 18	Semester Exam

**PHARMACOLOGY PROGRAM
ELECTIVE COURSES**

Course Title: NEUROPHARMACOLOGY

Course Code: PHM-723

Credit Hours: 3+0

Pre requisites:

Pharmacological Concepts and Adrenergic Pharmacology
Cholinergic and Cardio Respiratory Pharmacology

Objectives

1. Describe the biochemical basis of neuropharmacology
2. Describe the pharmacokinetics, mechanism of action, clinical uses and adverse effects of benzodiazepines

3. Describe the pharmacokinetics of barbiturates, mechanism of action, clinical uses and adverse effects of barbiturates
4. Describe the mechanism, adverse effects and drug-drug interactions of various groups of anti-seizure drugs
5. Describe the mechanism of action, merits, demerits and adverse effects of intravenous and inhalational anesthetic agents
6. Describe the pharmacology and strategies of administration of local anesthetic drugs
7. Describe the mechanism, uses and adverse effects of skeletal muscle relaxants
8. Explain the centrally acting and directly acting muscle relaxants
9. Describe the mechanism of action, uses and adverse effects of CNS stimulants
10. Describe the pharmacokinetics and pharmacodynamics of drugs of abuse
11. Describe the pharmacokinetics, adverse effects and treatment of alcoholism
12. Describe the drug treatment of parkinsonism
13. Describe the kinetics, mechanism of action, uses and adverse effects of antipsychotic drugs
14. Describe mechanism of action, uses and adverse effects of lithium
15. Describe the various antidepressant drug groups according to their mechanism of action

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Describe neurotransmitters and principles of neurotransmission in central nervous system including ways in which they may be altered by diseases and drugs
2. Describe the methods of general and local anesthesia
3. Describe the pharmacology of drugs used in epilepsy, Parkinson's disease
4. Comprehend pharmacology of antipsychotic, anti manic and antidepressant drugs with effects on the nerve inhibitors and nerve stimulators

Course Outline:

Neurohumoral transmission and CNS, sedatives and hypnotics, pre-anesthetic medications, stages for anesthesia, mechanism of action, pharmacokinetics of inhalational anesthetics, volatile liquids, gases, intravenous general anesthetics, local anesthetics, insomnia, drug dependence and drug abuse, alcohol, drugs used in treatment of epilepsy and Parkinson's disease, anti-psychotics, phenothiazines, butyrophenones, haloperidol, thiothixene, anti-manic drugs, lithium, anti-depressants, tricyclic anti-depressants, SSRI inhibitors, MAO inhibitors.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

16-Week Lesson Plan

<u>Week No</u>	<u>Course Contents</u>
Week 1	Biochemical basis of neuropharmacology
Week 2	Sedatives and Hypnotic drugs- Benzodiazepines
Week 3	Sedatives and Hypnotic drugs- Barbiturates. Quiz -1
Week 4	Anti-seizure drugs. Assignment-1
Week 5	General anesthetic drugs
Week 6	Local anesthetic drugs and their strategies of administration.Qui-2
Week 7	Skeletal muscle relaxants
Week 8	Centrally acting and directly acting muscle relaxants
Week 9	Mid-Term
Week 10	CNS stimulants and drugs of abuse
Week 11	Pharmacokinetics, adverse effects and treatment of alcoholism
Week 12	Parkinson's disease. Quiz-3
Week 13	Antipsychotic drugs. Assignment-2
Week 14	Lithium
Week 15	Antidepressant drugs. Quiz-4
Week 16	Presentations
Week 17	Semester exam
Week18	Semester Exam

Course Title: ENDOCRINE & GASTROINTESTINAL PHARMACOLOGY**Course Code:** PHM-724**Credit Hours:** 3+0**Pre requisite:** Adrenergic and Cholinergic Pharmacology**Objectives:**

1. Describe emetics and antiemetic drugs
2. Describe the drug treatment of acid peptic disease
3. Describe purgatives on the basis of their mechanism of action
4. Describe anti-diarrhoeal drugs
5. Describe the drug treatment of inflammatory bowel disease
6. Explain prokinetic agents
7. Describe the hormones of anterior and posterior pituitary hormones
8. Describe the drug treatment of hypothyroidism
9. Describe the pharmacology of anti-thyroid drugs
10. Describe the mechanism of action, adverse effects and clinical uses of female sex hormones and their antagonists
11. Explain the mechanism of action, clinical uses and adverse effects of male sex hormones and their antagonists
12. Describe the parenteral drug treatment of diabetes mellitus
13. Describe the oral drug treatment of diabetes mellitus
14. Describe the pharmacology of parathyroid hormone
15. Describe the mechanism of action, clinical uses and adverse effects of drugs used as ectopic and tocolytic agents
16. Describe the mechanism of action, clinical uses and adverse effects of drugs acting on bone and mineral metabolism

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend knowledge of drugs acting on gastrointestinal tract
2. Comprehend hormones and their mechanism of action on the targeted sites
3. Describe antiestrogens, antiprogestins, SERMS and antiandrogens
4. Describe the pharmacology of drugs acting on uterus and reproductive tract
5. Describe the role of drugs acting on bone mineral metabolism

Course Outline:

Treatment of peptic ulcer, antacids, H2 receptor antagonists, proton pump inhibitors, ulcer healing drugs, purgatives, anti-diarrheals, drugs used in inflammatory bowel disease and chron's disease, emetics and anti-emetics, , Insulin and oral anti-diabetic drugs, anti-thyroid drugs, estrogens, progestins, oral contraceptives, selective estrogen receptor modulators, anabolic steroids, oxytocin, prostaglandins, ergot alkaloids, drugs acting on bone mineral metabolism.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram. G. Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe,RichardFinkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Sixteen Week Lesson Plan:

Week No **Course Contents**

- | | |
|---------|--|
| Week 1 | Emetics and antiemetic drugs |
| Week 2 | Drug treatment of acid peptic disease |
| Week 3 | Purgatives and anti-diarrheal drugs .Quiz -1 |
| Week 4 | Drug treatment of IBD and Chron's disease. Assignment-1 |
| Week 5 | Prokinetic agents. Anterior and posterior pituitary hormones |
| Week 6 | Drug treatment of hypothyroidism and hyperthyroidism. Quiz-2 |
| Week 7 | Female sex hormone drugs and their antagonists |
| Week 8 | Male sex hormone drugs and their antagonists |
| Week 9 | Mid-Term |
| Week 10 | Oral contraceptives and SERMS |
| Week 11 | Ecbolics and tocolytic drugs |
| Week 12 | Drug treatment of diabetes mellitus-1.Qui-3 |
| Week 13 | Drug treatment of diabetes mellitus -2. Assignment-2 |
| Week 14 | Pharmacology of parathyroid hormone and its clinical uses |
| Week 15 | Drugs acting on bone and mineral metabolism.Qui-4 |
| Week 16 | Presentation |
| Week 17 | Semester Exam |
| Week 18 | Semester Exam |

Course Title: CHEMOTHERAPY

Course Code: PHM-725

Credit Hours: 3+0

Pre requisite:

1. Molecular Biology
2. Pharmacological Concepts

Objectives:

1. Describe the role of antimicrobial drugs in controlling infection
2. Describe pharmacokinetics and pharmacodynamics of penicillins
3. Describe the pharmacokinetics and pharmacodynamics of cephalosporins
4. Explain the clinical uses and adverse effects of carbapenems and monobactams
5. Explain the mechanism of action, clinical uses and adverse effects of vancomycin
6. Describe the pharmacokinetic properties, mechanism, clinical uses and adverse effects of tetracyclines, aminoglycosides, macrolides, chloramphenicol, and clindamycin.
11. Describe the pharmacokinetic and dynamic properties of sulfonamides and fluoroquinolones
13. Describe the first line and 2nd line drug therapy for tuberculosis
14. Describe the drugs used in treatment of leprosy
15. Describe the pharmacokinetics and pharmacodynamics of antiviral drugs
16. Describe the pharmacology of antihelminthic drugs
17. Describe the mechanism, clinical uses and adverse effects of antifungal drugs
18. Describe the drugs used for the treatment of malaria
19. Describe the drug treatment of amebiasis, leishmaniasis and trypanosomiasis
21. Describe the mechanism of action and adverse effects of anticancer drugs
22. Describe the mechanism of resistance to anticancer drugs
23. Describe the pharmacology of dermatological drugs

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Comprehend the basic principles of pharmacotherapy
2. Describe the pharmacology of antibacterial, antiviral, antifungal, antiprotozoal, antihelminthic, anti-leishmaniasis, anti-trypanosomiasis, anticancer, dermatological drugs

Course Outline:

General principles of pharmacotherapy, penicillins, cephalosporins, carbapenams, monobactams, vancomycin, clindamycin, macrolides, sulphonamides, trimethoprim, co-trimoxazole, , tetracyclines, chloramphenicol, aminoglycosides, quinolones, urinary antiseptics, antituberculosis, antileprosy, antimalarial, antifungal, anti-amoebic , anti -viral, anthelmintics, antiprotozoal, anticancer and dermatological drugs.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com; Pharmacologycorner.com

Sixteen Week Lesson Plan:

<u>Week No</u>	<u>Course Contents</u>
Week 1	Role of antimicrobial drugs in controlling infection
Week 2	Cell wall synthesis inhibitors- Penicillins, Vancomycin
Week 3	Cephalosporins, Carbapenems, Monobactams. Quiz -1
Week 4	Tetracyclines and Aminoglycosides. Assignment-1
Week 5	Macrolides, Chloramphenicol, Clindamycin
Week 6	Sulfonamides and fluoroquinolones. Quiz-2
Week 7	Antituberculosis drugs
Week 8	Anti leprotic, Antiamoebic and Antifungal drugs
Week 9	Mid-Term
Week 10	Antiviral drugs-1
Week 11	Antiviral drugs-2
Week 12	Antihelmintic and Antiprotozoal drugs. Quiz-3
Week 13	Anticancer drugs-1. Assignment-2
Week 14	Anticancer drugs-2.
Week 15	Drugs used in dermatological diseases. Quiz-4
Week 16	Presentation
Week 17	Semester Exam
Week 18	Semester Exam

Course Title: TOXICOLOGY**Course Code: PHM-726****Credit Hours: 3+0****Course Objectives:**

1. Describe the principles of toxicology in kinetics and dynamics
2. Identify the drugs having mutagenic, carcinogenic and teratogenic potential
3. Describe toxicology of lead, arsenic and mercury
4. Describe the pharmacology of chelators
5. Explain the safety, legal and social factors associated with major organ system toxicities
6. List the major air pollutants and their clinical effects
7. Describe the features of carbon monoxide poisoning
8. Describe the features of insecticide poisoning and its treatment
9. Identify the toxic effects of chlorinated hydrocarbons and botanicals used as insecticides
10. Explain the toxicological significance of occupational and environmental pollution on public health
11. Describe the management of poisoned patient
12. Describe the treatment of toxic syndromes caused by acetaminophen, amphetamines and anticholinergic agents
13. Describe the treatment of toxic syndromes caused by antidepressants, antipsychotics and aspirin
14. Describe the treatment of toxic syndromes caused by cholinesterase inhibitors, beta blockers and calcium channel blockers
15. Describe the treatment of toxic syndromes caused by carbon monoxide gas, cyanide and digoxin
16. Describe the treatment of toxic syndromes caused by sedatives, hypnotics and alcohols
17. Describe the treatment of toxic syndromes caused by iron, opioids, and theophylline
18. Describe the treatment of toxic syndromes caused by rattle snake venom

Course Learning Outcomes:

Upon completion of course the students will be able to:

1. Comprehend basic knowledge of principles of toxicology
2. Describe treatment of poisoned patient
3. Comprehend toxic syndromes and their treatment
4. Describe the role of toxicology with respect to environment, occupation and Public Health

Course Outline:

Toxicology and its scope, disposition of xenobiotics: ADME and factors modifying these processes, principles of toxicodynamics, heavy metals, chelators, management of poisoned patient, neurotoxicology, genetic toxicology, chemical carcinogenesis, developmental toxicology and endocrine disruption with reproductive toxicology, factors effecting safety issues, legal and social issues, occupational toxicology and public health, environmental health and aspects of clinical toxicology, management of poisoned patient, laboratory and imaging procedures, toxic syndrome caused by acetaminophen, amphetamines, anticholinergic agents, antidepressants, antipsychotics, aspirin, beta blockers, calcium channel blockers, carbon monoxide and other gases, cholinesterase inhibitors,, cyanide, digoxin, sedatives and hypnotics, alcohols, iron, opioids, theophylline and rattle snake venom.

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe,RichardFinkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Course Title: PHARMACOGENETICS

Course Code: PHM-727

Credit Hours: 3+0

Course Objectives:

1. Identify and categorize the genetic factors that underlie the differences in responses to drugs
2. Describe the rational, individual / personalized therapy
3. Identify screening for patients carrying genes that place them at risk to certain therapies
4. Describe potentially dangerous drugs for carriers of a given polymorphism
5. Explain the frequency of pharmacogenetic phenotypes
6. Identify the uses of gene therapy
7. Understand the use of nanoparticles for therapy

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Describe basic concepts of genetically determined interindividual differences in therapeutic response to drugs

2. Describe basic concepts of genetically determined interindividual differences in susceptibility to adverse effects
3. Comprehend the principles of gene therapy
4. Identify the importance of nanotechnology in pharmacotherapeutics Genetic variation in the effects of drugs and xenobiotics, body's reactions to drugs ,pharmacologically relevant genetic and genomic variation in humans and animals, single nucleotide polymorphisms, large structural variations, polymorphisms in different ethnicities, effects on gene expression and function, method and strategy development, clinical significance, exploration and applications of clinical translation, epigenetic and non-genetic factors to drug disposition and drug response, nucleic acid-based therapies, use of genome editing tools, nanoparticle manufacturing, dosage forms, mechanism of action, toxicities

Resources

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe,RichardFinkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Course Outline:

Course Title: AUTACOIDS & ANALGESICS

Course Code: PHM-728

Credit Hours: 3+0

Course Objectives:

1. Describe the synthesis, mechanism of actions and effects caused by histamine, bradykinin, 5-hydroxytryptamine
2. Describe the pharmacokinetics, mechanism of action ,clinical uses and adverse effects of histamine, bradykinin, 5-hydroxytryptamine antagonists
3. Describe the role and clinical uses of eicosanoids and prostaglandins
4. Describe the drug treatment of migraine
5. Describe the pharmacokinetics and dynamics of drugs used in treatment of asthma
6. Describe the pharmacology of drugs used for the treatment of cough
7. Describe the pharmacokinetics and dynamics of NSAIDS
8. Describe the drug treatment of arthritis (RA, OA and gout)
9. Describe mechanism of action and clinical uses of immunosuppressant and immunomodulator drugs
10. Describe the pharmacokinetics and pharmacodynamics of glucocorticoids
11. Describe the pharmacology of opioid analgesic drugs and their antagonists
12. Describe the role of angiotensin, kinins, vasopressin, natriuretic peptides in disease processes
13. Describe the role of endothelins, VIP, substance P, neuropeptides, calcitonin gene related peptide

Course Learning Outcomes:

Upon completion of course the students will be able to:

1. Describe the mediators of inflammation and immune reactions
2. Comprehend basic knowledge of anti-inflammatory drugs and autacoids
3. Comprehend the major inflammatory diseases and their therapeutics
4. Describe the current therapies based on manipulation of the immune system Histamine, bradykinin, 5-hydroxytryptamine and their antagonists, anti-histamine, H1 blockers, eicosanoids and prostaglandins, drugs used in the treatment of migraine and bronchial asthma, NSAIDS, treatment of rheumatoid arthritis, treatment of gout, opioid analgesics, angiotensin, kinins, vasopressin, natriuretic peptides, endothelins, VIP, substance P, neuropeptides, calcitonin gene related peptide

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Course Title: AGE SPECIFIC PHARMACOLOGY

Course Code: PHM-729

Credit Hours: 3+0

Course Objectives:

1. Describe the factors affecting drug transport through placenta
2. Describe the pharmacokinetic parameters of drug in maternal and fetal body
3. Describe the pharmacodynamic parameters of drug in maternal and fetal body
4. Describe absorption, distribution, metabolism and excretion of drug in infants and children
5. Describe the various types of pediatric dosage forms and pediatric drug dosage calculation
6. Describe the pharmacology of drugs used during lactation
7. Describe the pharmacokinetic and pharmacodynamic changes associated with aging
8. Describe the pharmacology of sedative hypnotics and analgesics drugs in geriatric patients
9. Describe the pharmacology of antipsychotic and antidepressant drugs in geriatric patients
10. Describe the pharmacology of antihypertensive and antiarrhythmic drugs in geriatric patients
11. Describe the pharmacology of antimicrobial and anti-inflammatory drugs in geriatric patients
12. Describe the pharmacology of ophthalmic drugs and drugs used in Alzheimer's disease among geriatric patients
13. Describe adverse drug reactions of commonly used drugs in elderly patients

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Describe pharmacokinetics and pharmacodynamics of drug therapy in pregnancy and lactation
2. Describe drug dosage forms and dosage in infants and children

3. Describe pharmacological changes associated with aging
4. Describe major drug groups and adverse reactions in geriatric patients

Course Outline:

Lipid solubility , molecular size, pH, placental transporters, protein binding, placental and fetal metabolism of drug, maternal and fetal drug actions, toxic drug actions in fetus, absorption, distribution, metabolism and excretion in infants and children, pediatric dosage forms, pediatric drug dosage, pharmacokinetic and pharmacodynamic changes with aging, sedative hypnotics, analgesics, antipsychotic, antidepressant, anti Alzheimer's disease, antihypertensive, antiarrhythmic, antimicrobial, anti-inflammatory, ophthalmic drugs use in geriatrics, adverse drug reactions in elderly

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe,RichardFinkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Course Title: DENTAL PHARMACOLOGY

Course Code: PHM-730

Credit Hours: 3+0

Course Objectives:

1. Describe kinetics and dynamics of drug
2. Describe the modalities of pain and mechanism of controlling it
3. Describe components of a prescription and basic pharmacological terminology
4. Describe dosages, indications and contraindications of some therapeutic agents frequently used in dentistry
5. Describe the pharmacokinetics and dynamics of analgesics agents
6. Describe the pharmacokinetics and dynamics of anesthetic agents
7. Describe the pharmacokinetics and dynamics of antibiotic agents
8. Describe the pharmacokinetics and dynamics of anxiolytic agents
9. Describe the role of vitamins and minerals in dental care
10. Discuss the chemotherapeutic management of oral conditions
11. Describe dental and medical emergency situations and the drugs used in their management

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Identify the uses, actions, and contraindications of drugs commonly taken for dental care
2. Recognize systemic and oral manifestations of drugs used in dentistry
3. Describe emergency drugs used in dentistry

Course Outline:

General principles: of drug action, drug interactions, prescription writing,
Drugs used in dentistry: autonomic drugs, non-opioid analgesics, opioid analgesics and antagonists, anti-infective agents, antifungal and antiviral agents, local anesthetics ,anti-anxiety agents, general anesthetics, vitamins and minerals, oral conditions and their treatment, Drugs that may alter dental treatment: cardiovascular drugs, anticonvulsants, psychotherapeutic agents, autacoids and antihistamines, adrenocorticosteroids, other hormones, antineoplastic drugs ,respiratory and gastrointestinal drugs ,Special situations: emergency drugs

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe,RichardFinkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology
5. Dental Textbook: Weinberg MA, WestphalTheile C, Fine JB. Oral Pharmacology for the Dental Hygienist, 2ndedition Prentice Hall. 2013.

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Course Title: TISSUE PROCESSING

Course Code: MED-706

Credit Hours: 3 (1+2)

Objectives: •

- Identify the tissue at the cellular level
- Identify the process of tissue preparation used for light microscopy
- Identify the fixatives used for tissue preservation
- Discuss tissue processing techniques
- Recognize the process of paraffin embedding
- Identify the process of tissue sectioning
- Identify the different types of tissue sectioning
- Identify the process of dehydration and clearing
- Discuss the chemical basis of staining
- Identify basic histological staining
- Discuss different kinds of tissue staining

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

- Perform tissue preservation, processing and microtomy
- Describe tissue processing techniques
- Perform the process of tissue sectioning on microtome
- Perform histological staining
- Observe tissue at cellular level

Course Outline:

Fixation of tissues: Phenomenon, Common fixatives used or available: composition advantages and disadvantages. Clearing agents; Paraffin Embedding process; Sectioning Process: Microtomes and knives, their types and uses, Sharpening of knives, Problems encountered and their remedies.

Staining: Procedure, uses and interpretation of: Routine Haematoxylin and Eosin, special and latest histological techniques.

Mounting; Vital and supravital dyes and study of cells; Freezing microtome and frozen sectioning

Resources:

Recommended Books:

1. Junqueira LC, Carneiro J. Basic histology. California, U.S.A, Lange Medical publication.
2. Kelly, D.E, Wood, R.L, Enders, A.C. Bailey's Text Book of Microscopic Anatomy. Baltimore, U.S.A, Williams and Wilkins.
3. Burkit HG, Young B, Heath JW. Wheater's Functional histology London, Churchill living stone.
4. Faust, D.W.A Text Book of Histology. London, Chapman and Hall.
5. Ross MH, Pawlina W. Histology: A Text and Atlas, with Correlated Cell and Molecular Biology. Lippincott Williams & Wilkins.
6. Bancroft JD, Gamble M. Theory and practice of Histological Techniques. Philadelphia, PA: Churchill Livingstone/Elsevier.

Journals:

1. Journal of Histology & Histopathology ISSN 2055-091X
2. European Journal of Cell Biology
3. Cell and Tissue Research ISSN 0302766X, 14320878
4. Archives of Histology and Cytology
5. Journal of Microscopy ISSN 00222720, 13652818
6. International Journal of Developmental Biology

Reference Book:

Lesson CR, Lesson TS. Histology. Philadelphia .S.A, W. B. Saunders and Company.

Websites:

www.histology-world.com/

Course Title: DRUG BIO-SCREENING& HERBAL MEDICATIONS

Course Code: MED-707

Credit Hours: 3 (2+1)

Course Objectives:

1. Describe the role of drug screening
2. Describe in-vitro and in-vivo methods of drug screening
3. Describe screening of the drug and their metabolites in biological fluids
4. Describe instrumental methods of drug screening
5. Describe pitfalls and problems associated with drug screening
6. Describe the potential role of herbal medicine in health care
7. Discuss the relationship between clinical herbal pharmacology and medical pharmacology
8. Describe the principal chemical constituents of medicinal plants used for treating gastrointestinal, respiratory, immune and other disorders
9. Describe the pharmacology and adverse effects of Echinacea, Garlic, Ginkgo
10. Describe the pharmacology and adverse effects of Ginseng, Milk thistle, St. John's Wort
11. Describe the pharmacology and adverse effects of Saw palmetto, Coenzyme Q 10, Glucosamine and Melatonin
12. Describe herbal manufacturing techniques for liquid, solid and semisolid preparations

Course Learning Outcomes (CLOs):

Upon completion of course the students will be able to:

1. Describe the potential role of herbal medicine in health care
2. Discuss the relationship between clinical herbal pharmacology and medical pharmacology
3. Describe the principal constituents of medicinal plants and their pharmacological properties
4. Comprehend herbal manufacturing techniques for liquid, solid and semisolid preparations

Course Outline:

Drug screening , in- vitro and in-vivo methods of drug screening, drug screening on isolated tissue, screening of the drug and their metabolites in biological fluids, instrumental methods of drug screening, thin layer chromatography, gas chromatography, spectroscopic methods, high performance liquid chromatography, pitfalls and problems of drug screening, botanical substances as Echinacea, Garlic, Ginkgo, Ginseng, Milk thistle, St. John's Wort, Saw palmetto, Coenzyme Q 10, Glucosamine, Melatonin, therapeutic properties of herbal medications, use of herbal medications in treating gastrointestinal, respiratory, immune and other disorders, herbal manufacturing techniques for liquid, solid and semisolid preparations

Resources:

Recommended Books:

(Latest Edition of all mentioned books should be referred)

1. Basic & Clinical Pharmacology by Bertram.G.Katzung 13th edition
2. Rang & Dale's Pharmacology by H.P. Rang, M.M. Dale, R.J. Flower
3. Lippincott's Illustrated Reviews: Pharmacology by Richard A Harvey, Pamela C Champe, Richard Finkel, and Luigi X. Cubeddu
4. Merck Manuals Clinical pharmacology

Reference Book:

Basis of Pharmacology by Goodman & Gillman Latest Ed.

Websites:

Drugs.com

Pharmacologycorner.com

Appendage 2643**TRANSCRIPT OF DEAN ES's PRESENTATION****Slide-1****Agenda Item 2643**

Framework for Grooming BU Students
 'Engineering Sciences Perspective'

Slide-2**Typical Undergrad Curriculum in FoES**

Total Credit Hours	130 – 140
Core Courses	65 – 70 %
Non-Core Courses	30 – 35 %
Non – Core Courses	
Natural Sciences – Maths, Physics	
Social Sciences, Management Sciences	

Slide-3**Committee to Review / Revise Non-core courses**

Following committee was constituted to review / revise non-core courses in FoES in line with **framework for grooming students** and in light of **accreditation bodies' guidelines**:

- Dr. Khurram Shahzad CE
- Dr. Ansa Rukya Saleem E&ES
- Dr. Raja M. Suleman SE
- Dr. Junaid Imtiaz EE
- Ms. Sabeen Arshad CS
- Ms. Tahira Anwar SS (Co-opted)

Slide-4**List of Courses Revised (grooming framework)**

	Courses	Objectives achieved
Language Proficiency	Functional English	Oral, writing and presentation skills are enhanced.
	Communication Skills	
	Technical Writing & Presentation	
Social Sciences	Professional / Engineering Ethics	Do's and Don'ts of the technical as well as normal living society are taught.
	Social Sciences Elective	
Management Sciences	Entrepreneurship Entrepreneurship & Leadership	Career exploration, decision making, self & project/business management skills

Slide-5
Outcome Based Education (OBE)

- Pakistan has been awarded Full Membership of Washington Accord.
- All Engineering Programs in Pakistan are aligning themselves with OBE, and the same has started at BU w.e.f. Fall' 2016.
- The comprehensive goals targeted in OBE cater the needs proposed by the Faculty of M&SS.
- Program Educational Objectives (PEO) Program Learning Outcomes (PLO) Course Learning Outcomes (CLO).

Slide-6
Program Learning Outcomes (PLO)

- *Engineering Knowledge*
- *Problem Analysis*
- *Design / Development of Solutions*
- *Investigation*
- *Modern Tool Usage*
- *The Engineer & Society*
- *Environment & Sustainability*
- *Ethics*
- *Individual & Team work*
- *Communication*
- *Project Management*
- *Lifelong Learning*

Slide-7
Further Recommendations

- Special seminars / workshops shall be arranged for final year undergraduate students (one hour slot / week)
 - ❖ To improve their communication and presentation skills, especially related to job search, applying for jobs, & interviews, and Mock Interviews etc. → LDC

Slide-8
Summary

- *Revised Course Outlines (Non-Core) have been forwarded to all HoDs in FoES and are being implemented in all departments across campuses.*
- *The final year students' special sessions (workshops, seminars, guest lectures, and trainings) – in coordination with LDC*
- *The curriculum of all Engineering Programs have been revised as per Course Learning Outcome (CLO) to match Program Learning Outcomes (PLO) which addresses all the required parameters of Grooming Framework.*
- *The revised curriculum (Core & Non-Core) would be reviewed by the Dean – MS during Academic Year 2017 – 18, and contents would be improved during Summer'18.*

Appendage 2712**New Courses Added: Recommended by HEC**

S#	Course Code	Title of Course	Cr. Hrs.
1	SEN 812	Agile Methods	3
2	SEN 813	Advanced Software Requirements Engineering	3
3	SEN 814	Ubiquitous Computing and Interaction	3
4	SEN 815	Verification and Validation	3
5	SEN 816	Middleware For Networked and Distributed Systems	3
6	CSC 801	Advanced Information Retrieval	3

Added From MS(SE) and MS(CS) Roadmaps

S#	Course Code	Title of Course	Cr. Hrs.
1	SEN 720	Advanced Human Computer Interaction	3
2	SEN 756	Advanced Usability Engineering	3
3	SEN 758	Component-based Software Engineering	3
4	SEN 759	Software Re-Engineering	3
5	SEN 760	Complex Adaptive Systems	3
6	SEN 761	Semantic Web	3
7	SEN 762	Advanced Big Data Analytics	3
8	SEN 763	Advanced Software Engineering	3
9	CSC 704	Advanced Cryptography	3
10	CSC 720	Advanced Operating Systems	3
11	CSC 741	Advanced Natural Language Processing	3
12	CSC 744	Advanced Computer Graphics	3
13	CSC 746	Advanced Data Mining	3
14	CSC 753	Distributed Databases	3
15	CSC 757	IP Multimedia System	3
16	CSC 758	Parallel Processing	3
17	CSC 760	Advanced Data Warehousing	3
18	CSC 781	Cloud Computing	3
19	CEN 745	Advanced Digital Image Processing	3
20	EET 710	Advanced Computer Networks	3
21	EET 726	Advanced Internet Technologies	3

Deleted Electives From PhD Roadmap

S#	Course Code	Title of Course	Cr. Hrs.
1	CEN-741	ASIC Design Methodology	3
2	CEN-754	MOS VLSI Circuit Design	3
3	EEN-728	Real Time DSP Design and Applications	3
4	EET-711	Advanced Digital Communications	3
5	EEP-770	Power Management in Wired and Wireless Systems	3
6	EEP-771	Lower Power System Design	3
7	EEP-772	Power Awareness in Distributed Systems	3
8	EEP-773	Power System Stability and Dynamics	3
9	EEP-774	Power System Transients	3
10	EEP-775	HVDC and Flexible AC Transmission	3
11	EEP-776	Rural Electrification and Distributed Generation	3
12	EEP-777	Artificial Intelligence Techniques in Power Systems	3

13	EEP-778	Power System Deregulation	3
14	CSC-719	Machine Learning	3
15	SEN-745	Date Ware Housing and Mining	3
16	ESC-703	Advanced Qualitative Research Methods	3
17	ESC-704	Advanced Quantitative Research Methods	3
18	ESC-705	Critical Review of Literature	3
19	GSC-701	Logic and Research	3
20	EEN-824	On-chip Interconnection Networks	3
21	EEN-825	Optimal Sampled-Data Control Systems	3
22	EEN-826	Networked Dynamic Systems	3
23	EEN-827	Modern Control Theory	3
24	EEN-828	Advanced Nonlinear Control Systems	3

**Proposed PhD (Software Engineering) Roadmap
Compulsory Courses**

S#	Course Code	Title of Course	Cr. Hrs.
1	ESC 702	Research Methods in PhD Studies	3

Elective Courses

S#	Course Code	Title of Course	Cr. Hrs.
1	SEN-720	Advanced Human Computer Interaction	3
2	SEN-723	Formal Methods and Specifications	3
3	SEN-751	Human Aspects in Software Engineering	3
4	SEN-753	Power Aware Computing	3
5	SEN-754	Advanced Web Computing System and Application	3
6	SEN-755	Service Oriented Computing	3
7	SEN-756	Advanced Usability Engineering	3
8	SEN-758	Component-based Software Engineering	3
9	SEN-759	Software Re-Engineering	3
10	SEN-760	Complex Adaptive Systems	3
11	SEN-761	Semantic Web	3
12	SEN-762	Advanced Big Data Analytics	3
13	SEN-763	Advanced Software Engineering	3
14	SEN-812	Agile Methods	3
15	SEN-813	Advanced Software Requirements Engineering	3
16	SEN-814	Ubiquitous Computing and Interaction	3
17	SEN-815	Verification and Validation	3
18	SEN-816	Middleware For Networked and Distributed Systems	3
19	CSC-704	Advanced Cryptography	3
20	CSC-711	Advanced Artificial Intelligence	3
21	CSC-720	Advanced Operating Systems	3
22	CSC-741	Advanced Natural Language Processing	3
23	CSC-744	Advanced Computer Graphics	3
24	CSC-746	Advanced Data Mining	3
25	CSC-750	Advanced Neural Networks	3
26	CSC-751	Pattern Recognition	3
27	CSC-753	Distributed Databases	3
28	CSC-757	IP Multimedia System	3
29	CSC-758	Parallel Processing	3
30	CSC-759	Agent Based Modeling	3

31	CSC-760	Advanced Data Warehousing	3
32	CSC-764	Computer Vision	3
33	CSC-765	Bio Medical Image Analysis	3
34	CSC-781	Cloud Computing	3
35	CSC-801	Advanced Information Retrieval	3
36	CEN-707	Advanced Distributed Systems	3
37	CEN-708	Advanced System Modeling and Simulation	3
38	CEN-720	Advanced Computer Architecture	3
39	CEN-740	Advanced Embedded Systems	3
40	CEN-742	Advanced Digital System Design	3
41	CEN-745	Advanced Digital Image Processing	3
42	EET-710	Advanced Computer Networks	3
43	EET-726	Advanced Internet Technologies	3
44	EET-850	Wireless Sensor Networks	3
45	EET-851	Mobile and ad-hoc Networks	3
46	EEN-725	Advanced Digital Signal Processing	3
47	GSC-700	Advanced Engineering Mathematics	3

Courses Details

Course Title: Agile Methods
Course Code: SEN-812
Credit Hours: (03)

Course Description: Agile methods are being applied in business and industry in order to transit from the more rigid-process-driven culture to a customer-and business-value driven approach. This course describes about the agile methods, and how they are implemented, and their impact on software engineering. A variety of agile methods will be covered in this course; however, the focus will be on Scrum and Extreme Programming. It also deals with the issues associated with planning and controlling agile projects, along with the implications of empowered teams on the customer-supplier dynamics. In addition, a discussion of the some of the issues related to the organizations while adopting agile practices. Upon completion of this course, the students will be able to:

- Understand the fundamental concepts of agile methods and how they can be applied
- Hands-on-skills and experience applying agile values and principles
- Tailor an agile method to the needs of the project
- Learn the strategic business drivers and benefits of agile methods, and the inherent complexities companies experience while adopting and scaling agile to the enterprise

Recommended Books/Reading Materials:

1. Maximini, D. (2015). *The Scrum Culture: Introducing Agile Methods in Organization*. Springer.
2. Ashmore, S., & Runyan, K. (2014). *Introduction to Agile Methods*. Pearson Education Inc.
3. Beyer, H. (2010). *User-Centered Agile Methods*. Morgan & Claypool Publishers.
4. Bay, T. et al. (2015). *Co-Pilot: Using Agile Methods To Land IT Projects Smoothly*. Comerge AG, Switzerland.
5. Lankhorst, M. (Ed.) (2015). *Agile Service Development: Combining Agile Methods and Flexible Solutions*. Springer.
6. Collier, K. (2012). *Agile Analytics: A Value-Driven Approach To Business Intelligence and Data Warehousing*. Pearson Education Inc.
7. Meyer, B. (2014). *Agile!: The Good, The Hype And The Ugly*. Springer.
8. Dingsoyr, T., Dyba, T., Moe, N.B. (Eds.) (2010). *Agile Software Development: Current Research and Future Directions*. Springer.

Course Title: Advanced Software Requirements Engineering
Course Code: SEN-813
Credit Hours: (03)

Course Description: This course exposes students to the problem of determining and specifying what a proposed software system should do, why and for whom the system is needed; not how the system should do it, which is the topic of downstream software engineering activities such as design and coding. There are some nontechnical aspects of the course, with respect to communication and negotiation with multiple stakeholders. Most of the course covers technical approaches to the requirements problem, such as techniques for eliciting stakeholder goals and requirements, notations and models for documenting and specifying requirements, and techniques for analyzing requirements. The course is a practical guide to Requirements engineering and upon completion of this course, the students will be able to:

- Understand how to analyze a system and its scope, stakeholders etc. Knowledge of techniques available to ensure competence in complete and efficient elicitation requirements
- Understand the different types of documentation options available at different levels of the requirements process and the content required
- How to write good quality natural language requirements, some common issues associated with writing them and possible tools to assist in consistency
- How to ensure a good requirements management process, considering grouping, visualization and movement and traceability of requirements through the process
- To know how to apply the learnt concepts, knowledge and techniques to solve real world problems
- Understanding the need for research in selected topics in requirements engineering.

Recommended Books/Reading Materials:

1. Dick, J., Hull, E., & Jackson, K. (2017). *Requirements engineering*. Springer.
2. Hatley, D., Hruschka, P., & Pirbhai, I. (2013). *Process for system architecture and requirements engineering*. Addison-Wesley.
3. Hofmann, H. F. (2013). *Requirements engineering: a situated discovery process*. Springer-Verlag.
4. Sutcliffe, A. (2012). *User-centred requirements engineering*. Springer Science & Business Media.
5. Eric, S. K. (Ed.). (2011). *Social modeling for requirements engineering*. Mit Press.
6. Pohl, K. (2010). *Requirements engineering: fundamentals, principles, and techniques*. Springer Publishing Company, Incorporated.
7. Kotonya, G., & Sommerville, I. (1998). *Requirements engineering: processes and techniques*. Wiley Publishing.

Course Title: Ubiquitous Computing and Interaction
Course Code: SEN-814
Credit Hours: (03)

Course Description: The goal of the course is to give knowledge about existing theoretical and practical requirements for the development of interactive (ubiquitous computing) environments where physical and virtual objects cooperate and communicate visibly and invisibly in order to facilitate human activity. The term *ubiquitous computing* describes the idea of incorporating sensing, computation, and communication into everyday things in order to make them and their surroundings "smart". Smart things can detect where they are, sense what is around them, and remember what they were used for previously. They may also interact with humans via mobile devices, use mighty services from the *cloud*, and communicate with other smart real-world objects, forming an *Internet of Things*.

The student will acquire knowledge about main research themes and experimental practices in the field of ubiquitous computing as well as develop her/his skills in constructing ubiquitous computing applications. Upon completion of this course, students will be able to:

- Describe the concept of ubiquitous computing and mobile wireless networks
- Recognize the research issues in ubiquitous computing
- Describe the different application development platforms for mobile and wearable devices and the particularities of programming context- and situation-aware applications
- Understand, explain and discuss the limitations in application programming for mobile devices in terms of processing power, memory and battery power
- Design applications for mobile and wearable devices, taking into account the limitations introduced by the nature of these devices
- Use tools such as App Inventor Develop for application programming

Recommended Books/Reading Materials:

1. Ekman, U., Bolter, J. D., Diaz, L., Sondergaard, M. (2017). *Ubiquitous Computing, Complexity, and Culture*, 1st Edition, Routledge Publishing.
2. Li, Q. and Shih, T. K. (2017). *Ubiquitous Multimedia Computing*. 1st Edition, Chapman and Hall/CRC.
3. Yang, L. T., Syukur, E., Loke, S. W. (2016). *Handbook on Mobile and Ubiquitous Computing: Status and Perspective*. 1st Edition, CRC Press.
4. *Journal of Personal and Ubiquitous Computing*. Springer, ISSN: 1617-4909.
5. *Journal of Pervasive and Mobile Computing*. Elsevier, ISSN: 1574-1192.

Course Title: Verification and Validation

Course Code: SEN-815

Credit Hours: (03)

Course Description: The validation and verification of software systems is a major issue in the IT industry. The objective of this course is to train future computer scientists and engineers in the fundamental concepts on which state-of-the-art software testing techniques are based. In addition, other important aspects related to software quality are addressed, though in a more superficial manner: quality assurance, safety, fault tolerance, reliability assessment. Though the orientation of the course is practical in nature, the goal is to focus on fundamental and rigorous principles that the students can benefit from for the many years to come, regardless of the evolution of technology. The course consists of general software testing principles; White-box testing based on code analysis; Black-box, specification-based testing; Testing object-oriented programs; Inspections and reviews; Safety analysis; Statistical testing and reliability analysis; Fault tolerance; Defensive programming. In addition, each PhD student will be given an extended curriculum within the field/research area of the course. Upon completion of this course, students will be able to:

- Demonstrate the application of verification and validation tasks and their outcomes during the software life cycle
- Apply various verification and validation techniques based on various characteristics of the system/software (safety, security, risk, etc.)
- Compare and Contrast theoretical and practical limitations to software verification and validation analysis
- Apply appropriate planning and scoping to a verification and validation effort based on the needs of the software system being developed
- Develop and analyze software verification and validation plan that reflects an understanding of verification and validation objectives, and appropriate problem/risk identification and tracking
- Appraise various research in software verification and validation and provide critical insight as to their content with the class

Recommended Books/Reading Materials:

1. Jean, J. (2017). *Software Verification and Validation*. 1st Edition, CreateSpace Independent Publishing Platform.
2. Fisher, M. S. (2010). *Software Verification and Validation: An Engineering and Scientific Approach*. Springer.
3. IEEE 1012 (2012). *Standard for System and Software Verification and Validation*.
4. Gopalakrishnan, G. (2006). *Computation Engineering: Applied Automata Theory and Logic*, Springer.
5. Grady, J. (2007). *System Verification: Proving the design solution satisfies the requirements*, Academic Press.
6. Chemuturi, M. (2010). *Mastering Software Quality Assurance: Best Practices, Tools and Techniques for Software Developers*, J. Ross Publishing.
7. Engel, A. (2010). *Verification, Validation and Testing of Engineered Systems*, Wiley.

Course Title: **Middleware for Networked and Distributed Systems****Course Code:** **SEN-816****Credit Hours:** (03)

Course Description: The course would discuss concepts, techniques, and issues in designing and developing middleware-based architectures of networked and distributed systems that provides high performance and Quality of Service for emerging applications. Roles and features of middleware systems, middleware layers, models, and taxonomy would be covered. The course prepares students for design, implementation, and integration of complex

Middleware-based networking and distributed systems. Students will be introduced to existing standards and technologies used for development of middleware systems. The students will explore their relative advantages & shortcomings and be able to use them in building various types of networking and distributed applications. Standards that the course would cover include CORBA, DCOM, Jini and Espeak. Furthermore, some case studies and research and design issues related to middleware would be address.

Recommended Books/Reading Materials:

1. Distributed Systems Architecture: A Middleware Approach, 1st edition, by Arno Puder, Kay Römer and Frank Pilhofer, Morgan Kaufmann, 2005.
2. Introduction to Middleware: Web Services, Object Components, and Cloud Computing, 1st edition, by Letha Hughes Etzkorn, Chapman and Hall/CRC, 2017.
3. IT Architectures and Middleware: Strategies for Building Large, Integrated Systems, 2nd edition, by Chris Britton and Peter Bye, Addison-Wesley Professional, 2004.
4. Middleware for Communications, by Qusay H. Mahmoud, John Wiley & Sons, 2004.
5. Middleware Networks: Concept, Design and Deployment of Internet Infrastructure, by M. Lerner, G. Vanecek, N. Vidovic, D. Vrsalovic, Springer, 2000.
6. IEEE Distributed Systems Online, IEEE Computer Society, [Available Online] <http://ieeexplore.ieee.org/servlet/opac?punumber=8968>.
7. Journal of Parallel and Distributed Computing, Elsevier, [Available Online] <https://www.journals.elsevier.com/journal-of-parallel-and-distributed-computing>.

Course Title: **Advanced Information Retrieval****Course Code:** **CSC-801****Credit Hours:** (03)

Course Description: With the exponential growth in the available digital information (e.g. web pages, emails, news, and social networks) requires intelligent agents that can retrieve relevant information. Web search engines and natural language processing systems are the domains where information

retrieval is used most frequently. This course covers the fundamental concepts, theories and algorithms that can be used for information retrieval and text mining. The contents include efficient text indexing, evaluation and interface issues, document clustering and classification, Boolean and vector-space retrieval models, recommendations systems, information extraction, machine learning-based ranking approaches and Web information retrieval. Upon completion of this course, the students will be able to:

- Understand the fundamental concepts, theories and algorithms of information retrieval
- Hands-on-skills and experience applying information retrieval techniques in real world problems
- Learn tools and techniques to do research in the area of text mining or information retrieval.

Recommended Books/Reading Materials:

1. Baeza-Yates, R., Ribeiro-Neto, B. (2011). *Modern Information Retrieval: The Concepts and Technology Behind Search*. Addison-Wesley.
2. Buttcher, S., Clarke, C.L.A., & Comback, G. V. (2016). *Information Retrieval: Implementing and Evaluating Search Engines*. MIT Press.
3. Croft, B., Metzler, D., & Strohman, T. (2011). *Search Engines: Information Retrieval In Practice*. Pearson Education Inc.
4. Singh, A., Dey, N., Ashour, A.S., & Santhi, V. (2017). *Web Semantics For Textual And Visual Information Retrieval*. IGI Global.
5. Bates, M. J. (Ed.) (2012). *Understanding Information Retrieval Systems: Management, Types and Standards*. CRC Press.
6. Crestani, F., Mizzaro, S., & Scagnetto, I. (2017). *Mobile Information Retrieval*. Springer.
7. Peters, C., Braschler, M., Clough, P. (2012). *Multilingual Information Retrieval: From Research To Practice*. Springer.
8. Strzalkowski, T. (Ed.). *Natural Language Information Retrieval*. Springer.
9. Ceri, S. et al. (2013). *Web Information Retrieval*. Springer.
10. Efthimiadis, E. et al. (Eds.) (2013). *Teaching and Learning In Information Retrieval*. Springer.

Appendage 2901-1

HEC POLICY GUIDELINES FOR UNIFORM IMPLEMENTATION OF SEMESTER BASED EXAMINATION SYSTEM – Approved Changes

Background:

1. HEC Policy Guidelines for Uniform Implementation Of Semester Based Examination System were promulgated to all HEIs. In the 29th ACM, the guidelines were presented and after deliberation, a committee was tasked to review.
2. The revised / reviewed recommendations were presented to BU academic and administrative management through VLC on 14 September 2017.
3. Only the approved recommendations are listed below for the upcoming ACM.

Recommendations

4. **Total Number of Credit Hours** for all 4-years undergraduate programs shall be between 124 and 140 (both inclusive). For 5 years undergraduate programs, the total number of credit hours shall be between 160 & 180 (both inclusive).
5. The existing programs with CHs beyond the lower & upper limits (defined above) are to be re-structured by FBoS and shall be presented in the next ACM. (Res: Deans)
6. **Maximum Duration of Programs:**
 - a. 3.5 / 4 years Programs: Maximum time limit of 6 years, further extendable for one year with the approval of Rector
 - b. 5 years Programs: Maximum time limit of 7.5 years, further extendable for one year with the approval of Rector
 - c. 1.5 / 2 Years MS / MPhil / MBA Programs: Maximum time limit of 3 years, further extendable for one year with the approval of Rector.
 - d. PhD Programs: Maximum time limit of 6 years, further extendable for two years (One year extension by FRC and One year by Rector).

All extensions granted shall be in continuation to regular / maximum time limit of the respective degree program.

7. Continuing Education Scheme of BU should be implemented and the students should be issued transcripts as per the decision of ACM and BUAR.
8. Admission offer letter of the foreign students shall be forwarded to HEC for issuance of NOC. (Res: IO, D-Admissions)
9. ‘Honour Code for Fair & Objective Assessment’ be added in the Faculty Handbook. Res: Academic Affairs & Exam Directorates.
10. Faculty Handbook – 20.f (*Duties & Responsibilities of Faculty Members*) shall be modified as under:
 - a. Making Known to students the goals & Requirements of each course, the nature of course contents and methods of evaluation to be employed at the start of semester (by the end of first week).
11. **Grading Policy:**
 - a. BU to continue with the Absolute Grading System, and the award of grades shall be modified as under:

Grade	Grade Point	Percentage
A	4.00	85 and above
A-	3.67	80 - 84
B+	3.33	75 - 79
B	3.00	71 - 74
B-	2.67	68 - 70
C+	2.33	64 - 67
C	2.00	61 - 63
C-	1.67	58 - 60
D+	1.33	54 - 57
D	1.00	50 - 53
F	0.00	Below 50

**There will be no C-, D+ and D grades in MS, MPhil & PhD programs.
Post Graduate students need to score 61 to pass the course.**

12. Final Transcript Format: The following shall be added in the final transcript:

- a. Date of Admission into Degree Program
- b. Type of Enrollment (Part Time / Full Time)
- c. Mode of Study – Regular or Private or Distance Learning
- d. Online Result Verification Key/ID
- e. CGPA & Percentage at the End of the Transcript (as a separate box)

13. Students Grievances Committee: Standing Students Grievances Committee at CU level shall be constituted with following members:

- a. Head CU
- b. HoD
- c. CU Exam Incharge
- d. 2 Senior Most FMs of the department

14. Student Grievances Committee Procedure

- a. In respect of grade, a student must submit the grievance application if any, in writing to the Head of the Department within (07) seven working days of the receipt of the grade.
- b. The Head of Department shall forward the grievance application to the Committee.
- c. It will be mandatory for the Committee to hear both sides (student and the instructor) and will give its final decision within (05) five working days or before the start of registration for the new semester, whichever comes earlier.
- d. The decision of the Committee will be deemed final and will be binding on all parties.

15. QA manual shall be modified to update the course file details as per HEC and accreditation bodies requirements.

16. **Permission of Writer for Special Students:** The following shall be added in BUARs:

- a. A visually impaired student may be allowed to attempt the Mid/Final Examinations of the University on Braille/ Computer/any other means of facilitation.
- b. In case a student is **Physically handicapped/visually impaired**, s/he may apply to the Head of the respective department (with medical certificate as proof of her/his disability) for permission to **engage a writer in Tests/ Examinations** of the University two weeks before the start of Tests/ Examinations. S/he will be allowed **45 minutes (maximum) extra time** to solve the question paper.

- c. The qualification of the writer of a handicapped student must be at least one step lower than that of the student.

17. Damaged/Lost Answer Script:

In an exceptional case where an answer script is damaged, lost or destroyed due to unavoidable circumstances, then the student may be given the following options:

- a. In case of Mid or Final Examination, if the candidate so desires, s/he shall be given another chance as a special case to take the Examination in that subject/course with no examination fee or the candidate shall be awarded his / her average marks in the subject / course. The CU head shall be intimated.
- b. In case of Internal Assessment (Sessional Marks, Quiz / Assignment), Average marks of the student shall be awarded to him / her in that module. The department would be intimated.

18. Courses on Pass / Fail Basis:

- a. The students shall be allowed to enroll in extra courses (out of their roadmap) in other departments with the approval of HoD.
- b. The students can enroll in maximum of 3 courses or 9 CHs.
- c. The grades of such courses shall be Pass / Fail.

Program / Degree	Regular Duration (Years)	Maximum Duration (Years)	Extended Duration with the approval of Competent Authority (Years)
All Undergrad Programs of 4 Years	4	6	1
MBA 3.5	3.5	6	1
LLB	5	7.5	1
All MS, MPhil Programs (1.5 / 2 Years) MBA 2.0 MBA 1.5	1.5 / 2	3	1
PhD	3	6	1+1 FRC, Rector

Appendage 2901-2**AMENDMENTS TO THE BU ACADEMIC RULES****A. Amendments to the Existing Clauses**

Clause to be Amended	Amendment
<p>1.3.14 Extended/Maximum Programme</p> <p>Duration. Maximum possible duration during which a student must complete the programme and meet all the degree requirements, failing which he/shall be considered Time-Barred and denied permission to continue studies in the programme.</p>	<p>The clause be split into two separate definitions:</p> <p>Maximum Programme Duration. Maximum duration which is usually 1.5 times the Regular Duration, during which the degree requirements must be completed, without requiring any approvals from the Rector or Academic Council or the HERC, as the case may be.</p> <p>Extension to Maximum Programme Duration. Under Special Circumstances, Extension to Maximum Programme Duration may be allowed to a student to complete the degree requirements, if approved by the Rector or the Academic Council or the HERC, or such other Authority, as the case may be. The Extension shall be contiguous to the Maximum Programme Duration, and shall start/count immediately after the Maximum Duration lapses. Duration of extension shall be degree-specific.</p>
<p>1.3.21 Letter Grades. One of the letters – A, B, C, D & F – assigned as an evaluation of overall academic performance in a course and indicated on the Transcript, with A the best passing Grade, D the worst passing Grade and F a failing Grade. Passing Grade may carry a plus (+) suffix to indicate a performance better than the parent Grade. Additionally, two other Letter Grades – I (Incomplete Course) and W (Withdrawal from Course) – will indicate, on the Transcript, the status of a course when not completed or withdrawn from</p>	<p>To be replaced with:</p> <p>“1.3.21 Letter Grades. One of the letters – A, B, C, D & F – assigned as an evaluation of overall academic performance in a course and indicated on the Transcript. The passing grades (A, B, C & D) may carry a plus (+) suffix to indicate a performance better than the parent Grade, or a minus (-), to indicate a shade below. Additionally, two other Letter Grades – I (Incomplete Course) and W (Withdrawal from Course) – will indicate, on the Transcript, the status of a course when not completed or withdrawn from</p>
<p>1.3.40 Time Bar/Barred. Programme/Degree status indicating that the student has been unable to complete the degree requirements within the Extended/ Maximum Programme Duration.</p>	<p>The text “/Maximum” be deleted</p>
<p>1.3.41 Time Late. Time period after the completion of the extended programme duration during which a student applies for Waiver to Time-Bar.</p>	<p>The clause be deleted, being no more relevant</p>

1.3.47 Waiver. Removal of the Time-Bar status for a specific period in terms of regular semesters or time period to enable a student to complete the shortfall in degree requirements.	The clause be deleted, being no more relevant
3.10 Graduation Timeframe & Time Bar Cases 3.10.1 The duration of a degree programme will commence from the first day of the commencement of first semester classes. Students completing all the requirements as per road map for the award of degree in their respective disciplines, within the extended/maximum graduation timeframe, as per Table-2, will be awarded the degree.	The heading clause 3.10 be trimmed to read: "3.10 Graduation Timeframe " In the clause 3.10.1, the text "extended/maximum" be deleted.
Following Clauses (3.10.2 to 3.10.7) be deleted:	
3.10.2 Students unable to complete the degree requirements within the extended/maximum duration of the programme shall become Time-Barred for award of degree, and their names shall be struck off the roll. Such students could apply, to the Rector through the Director Examination, for Waiver to the Time-Bar. All such cases shall be processed by the Director Examinations.	
3.10.3 There shall be a limit to shortfall in Credits or degree requirements for which Waiver can be applied for, as follows:	
<ul style="list-style-type: none"> a. <u>UG (except BE)/MBA1.5/MBA3.5/MS1.5 programmes.</u> 6 Credit Hours shortfall maximum. b. <u>MBA2.0/MS2.0/MPhil and the PG programmes.</u> Either maximum 6 Credit Hours shortfall in coursework or incomplete research, but not both. c. <u>PhD programmes.</u> Incomplete research work. 	
3.10.4 There shall be a time limit (Time Late) within which a Time Barred student may apply for Time Bar, as stipulated in Table-2. Post-Time Late applications shall not be processed.	
3.10.5 If Waiver to the Time Bar is approved, the student shall be required to complete the missing credits/degree requirements within the period of the Waiver. Credit Hours/degree shortfalls shall be met in a regular semester; there shall no summer session for the students granted Waiver to Time Bar. The student shall be awarded degree if he/she completes the missing Credit Hours/degree requirements successfully.	
3.10.6 Waivers shall not apply to the BE programmes which must be completed within seven years extended/maximum duration, as per the PEC rules. After seven years, Time Bar shall be permanent.	
3.10.7 The aforementioned rules are summed up in Table-2, for different categories of degrees/programmes, in terms of:-	
<ul style="list-style-type: none"> a. Regular Programme Duration. b. Extended/Maximum Duration. c. Maximum Degree/Programme shortfall permissible for Waiver application. d. Maximum Time Late during which Time Bar Waiver may be applied. e. Maximum Waiver that can be granted. 	

The deleted clauses (3.10.2 to 3.10.7) be replaced with the following clause:

"3.10.2 A student unable to complete the degree requirements within the Table-2 timeframe shall become Time-Barred for award of degree, and their name shall be struck off the roll. Under no circumstances, shall any waiver be granted to the Table-2 limits. However, a Time-Barred student may apply for admission into any other programme of the University and avail TOC, subject to the admission and TOC rules."

Following Existing Table-2 be deleted:

Programme/ Degree	Regular Duration (yrs)	Extended/ Maximum Duration (yrs)	Max Degree/ Prog shortfall permissible for waiver application (Credit Hrs)	Max Time Late during which Time-Bar Waiver may be applied for (yrs)	Maximum Waiver granted
BE	4.0	7.0	-	-	-
BS/BBA	4.0	6.0	6 Credit Hours (CH)	2.0	1 regular semester
LLB	5.0	7.5	6 CH	2.5	1 regular semester
MBA 3.5	3.5	5.5	6 CH	1.5	1 regular semester
MBA 1.5 & MS 1.5	1.5	3.0	6 CH	1.0	1 regular semester
MBA 2.0, MS 2.0, MPhil, LLM	2.0	4.0	6 CH or Incomplete Research	1.0	1 regular semester
PhD	3.0	6.0	Incomplete Research	-	1 year (by FDRC), then 1 year (by Rector)

The deleted Table-2 be replaced with the following table:

Degree	Regular Duration (yrs)	Maximum Duration* (yrs)	Extension to Maximum Duration* (yrs)
BE	4.0	7.0	Nil
BS/BBA	4.0	6.0	1 year (by Rector)
LLB	5.0	7.5	
MBA 3.5	3.5	6.0	
MBA 1.5 & MS 1.5	1.5	3.0	
MBA 2.0, MS 2.0, MPhil, LLM	2.0	3.0	
PhD	3.0 (Minimum)	6.0	2 years (1 st year by the FRC, 2 nd by the Rector)

* See definitions of these terms

<p>7.6.1 In the Bachelors level programmes, BU will use the following grading system to evaluate student performance:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Table 1: Grading System</th> </tr> <tr> <th>Letter Grade</th> <th>Percentage</th> <th>Grade Point</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>87-100</td> <td>4.0</td> </tr> <tr> <td>B+</td> <td>80-86</td> <td>3.5</td> </tr> <tr> <td>B</td> <td>72-79</td> <td>3.0</td> </tr> <tr> <td>C+</td> <td>66-71</td> <td>2.5</td> </tr> <tr> <td>C</td> <td>60-65</td> <td>2.0</td> </tr> <tr> <td>D</td> <td>50-59</td> <td>1.5</td> </tr> <tr> <td>F</td> <td>Below 50</td> <td>0.0</td> </tr> <tr> <td>W</td> <td>Withdrawn</td> <td></td> </tr> <tr> <td>I</td> <td>Incomplete</td> <td></td> </tr> </tbody> </table>	Table 1: Grading System			Letter Grade	Percentage	Grade Point	A	87-100	4.0	B+	80-86	3.5	B	72-79	3.0	C+	66-71	2.5	C	60-65	2.0	D	50-59	1.5	F	Below 50	0.0	W	Withdrawn		I	Incomplete		<p>To be replaced with:</p> <p>“7.6.1 In the Bachelors level programmes, the grading scheme shall be as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4">Table 2: Grading System</th> </tr> <tr> <th>Grade</th> <th>Grade Point</th> <th><u>LL %</u></th> <th><u>UL %</u></th> </tr> </thead> <tbody> <tr> <td>A</td> <td>4.00</td> <td>≥ 85</td> <td>-</td> </tr> <tr> <td>A-</td> <td>3.67</td> <td>≥ 80</td> <td>< 85</td> </tr> <tr> <td>B+</td> <td>3.33</td> <td>≥ 75</td> <td>< 80</td> </tr> <tr> <td>B</td> <td>3.00</td> <td>≥ 71</td> <td>< 75</td> </tr> <tr> <td>B-</td> <td>2.67</td> <td>≥ 68</td> <td>< 71</td> </tr> <tr> <td>C+</td> <td>2.33</td> <td>≥ 64</td> <td>< 68</td> </tr> <tr> <td>C</td> <td>2.00</td> <td>≥ 60</td> <td>< 64</td> </tr> <tr> <td>C-</td> <td>1.67</td> <td>≥ 57</td> <td>< 60</td> </tr> <tr> <td>D+</td> <td>1.33</td> <td>≥ 54</td> <td>< 57</td> </tr> <tr> <td>D</td> <td>1.00</td> <td>≥ 50</td> <td>< 53</td> </tr> <tr> <td>F</td> <td>0.00</td> <td>-</td> <td>< 50</td> </tr> <tr> <td>W</td> <td>Withdrawn</td> <td></td> <td></td> </tr> </tbody> </table>	Table 2: Grading System				Grade	Grade Point	<u>LL %</u>	<u>UL %</u>	A	4.00	≥ 85	-	A-	3.67	≥ 80	< 85	B+	3.33	≥ 75	< 80	B	3.00	≥ 71	< 75	B-	2.67	≥ 68	< 71	C+	2.33	≥ 64	< 68	C	2.00	≥ 60	< 64	C-	1.67	≥ 57	< 60	D+	1.33	≥ 54	< 57	D	1.00	≥ 50	< 53	F	0.00	-	< 50	W	Withdrawn		
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<p>7.6.2 In the MBA, MS, MPhil and PhD programmes, Grade F shall be reckoned below 60% marks and there shall be no D Grade.</p>	<p>To be reworded as follows:</p> <p>“7.6.2 Grading scheme for the MBA, MS, MPhil and PhD programmes shall be same as for the UG programmes, except that Grade F shall be reckoned below 60% marks and there shall be no C-, D+ and D Grades.”</p>																																																																																									
<p>7.7.8 Grade I. Incomplete</p>	<p>To be removed, being no more in practice.</p>																																																																																									
<p>7.6 Grading Guidelines for the Faculty The faculty shall grade the students' performance according to the following guidelines:</p>	<p>To be reworded as follows:</p> <p>“7.6 Grading Guidelines for the Faculty The Grades shall represent student's performance as follows, with suffixes - plus (+) and minus (-) - used to indicates shades of performance above or below the par:”</p>																																																																																									
<p>15.1 Faculty Members Code of Conduct</p>	<p>Following code to be added:</p> <p>“Fair & Objective Assessment of students.”</p>																																																																																									
<p>15.5 Academic Freedom with Responsibility</p> <p>15.5.2 Academic freedom carries with it responsibilities. For faculty members, the principal elements of responsibility shall include:</p>	<p>Following responsibility to be added:</p> <p>“The responsibility to make known to the students, right in the first week of the semester:</p> <ul style="list-style-type: none"> (1) the nature, objectives, goals/outcomes, requirements and contents of the course; (2) reading material and assessment methods for the course; 																																																																																									

	(3) the semester schedule clearly timelining teaching, extra-curricular activities and examinations (including quizzes, tests, assignments etc); and (4) any other information important for successful conduct of the course.”
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B. New Clauses

1. **Special Circumstances.** Circumstances beyond a student's control that may prevent the student from completing a degree programme within the Maximum Programme Duration. Such circumstances may include student's hospitalisation for extended periods, family tragedies, security situations, etc.
2. **Programmes Credit Hours** Various programmes shall follow the following maxima and minima:

<u>Programme</u>	<u>Minimum Credit Hours</u>	<u>Maximum Credit Hours</u>
UG (4-yrs)	124	140
UG (5-yrs)	160	180
MS /MPhil	30	36
PhD	54 (fixed)	

3. **NOC from HEC for Foreign Students.** NOC in respect of foreign students shall be sought from the HEC. Procedure will be to send the admission offer letter to the HEC for NOC.
4. **Courses on Pass/Fail Basis in UG Programmes.** An UG student may opt for Pass/Fail grading in up to nine Credit-Hours worth of Electives, which shall not count towards calculation of GPA/CGPA. Such an option shall be made at the time of registration and, once made, shall be properly documented and not changed under any circumstances. This provision shall not apply to core courses for the programme that the student is studying.
5. **Transcript** Student's Final Transcript shall carry the following information:

Front Side:

- a. Name of Student
- b. Father's Name
- c. Date of Birth
- d. Registration/Enrolment No.
- e. Name of the Degree Programme
- f. Date of Admission into the Degree Programme
- g. Semester-wise tabulated result, showing courses, their credit hrs, Grades earned therein and the corresponding Grade Points
- h. Type of Enrollment – Full Time or Part Time
- i. Printed photo of the student
- j. Date of Completion of Degree Requirements
- k. Mode of Study – Regular or Private or Distance Learning
- l. Online Result Verification Key/ID (at the end of the Transcript)
- m. GPA/CGPA and Overall Percentage against earned CGPA (at the end of the front side of Transcript)
- n. Signatures of the Issuing Officer(s)

Back Side:

- a. Basic Admission Requirement of the Programme
- b. Previous Degree held by the Student along with the Institution's Name
- c. Credit Hours Exempted/Transferred, if any/applicable.
- d. CNIC No. for Pakistani and Passport No. for Foreign Students
- e. Grading System and Scheme
- f. Charter Date of the University/DAI
- g. Name of Campus/College along with HEC Permission Date
- h. Water-mark seal.
- i. Signatures of the Issuing Officer(s)

6. Students Grievances Oversight Committee.

There shall be a Student Grievances Oversight Committee (SGOC), at CU level for each department, to address grievances of students against any teacher, instructor or administrative staff, with respect to matters of code of conduct, grades or any administrative matter. The Committee shall comprise:

- a. Head of CU
- b. HoD
- c. CU Exam-In-charge
- d. 2 senior most FMs of the department.

If grievance is about the award of a grade, the procedure shall be as follows:

- a. The student must submit the grievance, in writing, within seven working days of the receipt of the grade, to the HOD who shall forward it to the SGOC.
- b. The SGOC shall hear both sides and will give its decision, which shall be final and binding on all parties, within five working days or before the start of registration for the new semester, whichever is earlier.

7. Damaged/Lost Answer Script

Should an answer sheet for the Mid-Term or Final Exam be damaged or lost, for any reason, the student shall be given following options:

- a. Accept average marks; or
- b. Retake the Examination.

Average marks shall be the average of marks in all other subjects studied in that semester. There shall be no examination fee if the student opts for Retake Examination.

The same principle, suitably modified, shall apply in case of lost/damaged answer sheets for tests, quizzes, assignments etc.

8. Exam Writer for Special Students

A visually impaired student may be allowed to attempt the Mid/Final Exam on braille, computer or any other means of facilitation.

A physically handicapped/visually impaired student may be provided a writer for Tests/Exams. Procedure/conditions will be:

- a. Apply to the HOD two weeks in advance, with medical certificate proof of disability.
- b. Qualification of the writer shall be at least one step lower than that of the student. (e.g. for level 6 student, the writer should be level 5 or less).

- c. Student shall be allowed 45 minutes (max) extra time to solve the question paper.
- 9. **Course File** Faculty members shall maintain a Course File for each course, to plan and record of every activity during the course. The course file should contain:
 - a. Course Code and Title.
 - b. Course Description, Objectives and Learning Outcomes.
 - c. Course syllabus and roadmap, with changes, if any, over the last 3 semesters at least.
 - d. Semester Schedule, clearly timelining teaching, extra-curricular activities and examinations (including quizzes, tests, assignments etc).
 - e. Grading Policy for homework, quizzes, Mid-Semester Examination, Final Examination and Term Papers etc.
 - f. Copy of each case study, homework assignment, etc
 - g. Copy of Question Papers for quizzes, Mid-Semester Examination and Final Examination
 - h. Grading Sheets of the Course, detailing Statistical Data on the grades obtained by students.
 - i. Difficulties/problems faced.

Appendage 3001**Course Title: Central Asia in International Politics**

Course Code: IRS 538

Level: MS (International Relations)

Credit Hours: 3

Course Objectives

This course covers a predominantly Muslim region, which has recently come to prominence in world politics since the collapse of the Soviet Union in 1991. Its focus is on the national politics and regional and international relations of Afghanistan, Tajikistan, Uzbekistan, Turkmenistan, Kyrgyzstan and Kazakhstan, with references to other players' role in the region. The course concentrates on selected themes concerning political and social change, economic modernisation and regional security against the backdrop of sectarian, ethnolinguistic and ideological diversity, as well as outside interference and geopolitical rivalry.

Learning Outcomes

By the end of the course, students should be able to:

1. Feel familiar with the region, its peoples, geography, culture, and the place in the world.
2. Reflect on, and discuss the key concepts, themes, and schools of thought pertaining to politics and international relations of Central Asia.
3. Analyse historical and current developments in the region, using these intellectual tools.
4. Locate and collate materials on a topic relevant to Central Asian studies, and present your findings in a coherent manner on paper and orally.

Marks Distribution

Quiz and Assignments: 30 Marks

Mid-Term: 30 Marks

Final Exam: 40 Marks

Course Outlines

Week	Topic	Readings
1	Introduction of Central Asia: Pre Independence Era (Part-I)	<ol style="list-style-type: none"> 1. Ludmila Polonskaya and Alexei Malashenko, <i>Islam in Central Asia</i>, (Beirut: Ithaca Press Readings, 1994,) 2. Vitaly V. Naumkin, <i>Radical Islam in Central Asia: Between Pen and Rifle</i>, (Lanham: Rowman & Littlefield Publishers Inc., 2005,) 3. Dilip Hiro, <i>Between Marx And Muhammad: The Changing Face of Central Asia</i>, (London, HarperCollins Publishers, 1994,)
2	Introduction of Central Asia: Pre Independence Era (Part-II)	<ol style="list-style-type: none"> 1. Yuri Slezkine "The USSR as a Communal Apartment, or How a Socialist State Promoted Ethnic Particularism", <i>Slavic Review</i>, Vo. 53, No.2, (Summer 1994) 2. Adeeb Khalid, <i>The Politics of Muslim Cultural Reforms: Jadidism in Central Asia</i>, (Berkeley: University of California Press, 1998,) 3. Fazl-ur-Rahim Khan Marwat, <i>The Basmachi Movement in Soviet central Asia: A Study in Political Development</i>, (Peshawar: Emjay Books international, 1985,)
3	Introduction of Central Asia: Post Independence Era (Part-I)	<ol style="list-style-type: none"> 1. Edward W. Walker , <i>Dissolution: sovereignty and the breakup of the Soviet Union</i>, (Rowman & Littlefield, 2003) 2. Pauline Jones Luong, <i>The transformation of Central Asia: states and societies from Soviet rule to independence</i>, (Ithaca: Cornell University Press, 2004)
4	Introduction of Central Asia: Post	<ol style="list-style-type: none"> 1. Donnacha Ó Beacháin, Rob Kevlihan "Imagined democracy? Nation-building and elections in Central Asia", <i>Journal of Nationalism and Ethnicity</i>, Vol. 43, 2015

	Independence Era (Part-II)	
5	Regional Integration in Central Asia	<ol style="list-style-type: none"> Diana T. Kudaibergenova "Eurasian Economic Union integration in Kazakhstan and Kyrgyzstan", <i>European Politics and Security</i>, Vo. 17, No.1, 2016 Roy Allison "Virtual regionalism, regional structures and regime security in Central Asia ", <i>Central Asian Survey</i>, Vol. 27, No. 2, 2008. Sally N. Cummings, <i>Understanding Central Asia: politics and contested transformations</i>, (New York: Routledge, 2012)
6	The New Great Game?	<ol style="list-style-type: none"> Younkyoo Kim, Fabio Indeo "The new great game in Central Asia post 2014: The US "New Silk Road" strategy and Sino-Russian rivalry", <i>Communist and Post Communist Studies</i>, Vol. 46, No. 2, 2013 Alexander Cooley "Great games, local rules: the new great power contest in Central Asia", <i>Asian Politics and Policy</i>, Vol. 6, No. 2, 2012
7	China in Central Asia	<ol style="list-style-type: none"> Julie Wilhelmsen, Geir Flikke "Chinese–Russian Convergence and Central Asia", <i>Geopolitics</i>, Vol. 16, No. 4, 2011
8	Russia in Central Asia	<ol style="list-style-type: none"> Ivan Safranshuk, "Russian Policy in Central Asia: Strategic Context", <i>Observatoire franco-russe</i>, no. 8, 2014. Marlene Laruelle, "Russia and Central Asia", <i>European National Policies Series</i>, No. 17, 2014.
9	Pakistan-Central Asian Relations	<ol style="list-style-type: none"> Pakistan's Policy Towards Central Asian States, Adam Saud
10	Foreign policy of Kyrgyzstan	<ol style="list-style-type: none"> Alexander Cooley, "Kyrgyzstan at the Brink", <i>Current History</i>, (Vol. 109, Issue, 729, October, 2010)
11	Foreign policy of Uzbekistan	<ol style="list-style-type: none"> Aleksandr Pikalov "Uzbekistan between the great powers: a balancing act or a multi-vectorial approach? ", <i>Central Asian Survey</i>, Vol. 33, No. 3, 2014
12	Foreign policy of Kazakhstan	<ol style="list-style-type: none"> Reuel R. Hanks 'Multi-vector politics' and Kazakhstan's emerging role as a geo-strategic player in Central Asia ", <i>Journal of Balkan and Near Eastern Countries</i> , Vol. 11, No.3, 2009
13	Foreign policy of Tajikistan	<ol style="list-style-type: none"> Lena Jonson, <i>Tajikistan in the new Central Asia: geopolitics, great power rivalry and radical Islam</i>, (I. B. Taurus & Company, 2006)
14	Foreign policy of Turkmenistan	<ol style="list-style-type: none"> Luca Anceschi" Integrating domestic politics and foreign policy making: the cases of Turkmenistan and Uzbekistan", <i>Central Asian Survey</i> , Vol 29, No. 2, 2010
15	Political Islam in Central Asia: Post Independence Revivalism	No Reading
16	Left over and conclusion	

TRANSCRIPT OF PRESENTATION BY HOD HSS BUIC

Slide-1

Course Outline - Central Asia in International Politics

Slide-2

- Course Title: Central Asia in International Politics
- Course Code: IRS 538
- Level: MS (International Relations)
- Credit Hours: 3

Slide-3**Course Objectives**

This course covers a predominantly Muslim region, which has recently come to prominence in world politics since the collapse of the Soviet Union in 1991. Its focus is on the national politics and regional and international relations of Afghanistan, Tajikistan, Uzbekistan, Turkmenistan, Kyrgyzstan and Kazakhstan, with references to other players' role in the region. The course concentrates on selected themes concerning political and social change, economic modernisation and regional security against the backdrop of sectarian, ethnolinguistic and ideological diversity, as well as outside interference and geopolitical rivalry.

Slide-4**Learning Outcomes**

By the end of the course, students should be able to:

1. Be familiar with the region, its people, geography, culture, and the place in the world.
2. Reflect on, and discuss the key concepts, themes, and schools of thought pertaining to politics and international relations of Central Asia.
3. Analyse historic and current developments in the region, using intellectual tools.
4. Locate and collate material on a topic relevant to Central Asian studies, and present their findings in a coherent manner.

Slide-5**Course Outline**

Week	Topic
1	Introduction of Central Asia: Pre Independence Era (Part-I)
2	Introduction of Central Asia: Pre Independence Era (Part-II)
3	Introduction of Central Asia: Post Independence Era (Part-I)
4	Introduction of Central Asia: Post Independence Era (Part-II)
5	Regional Integration in Central Asia
6	The New Great Game?
7	China in Central Asia
8	Russia in Central Asia
9	Pakistan-Central Asian Relations
10	Foreign policy of Kyrgyzstan
11	Foreign policy of Uzbekistan
12	Foreign policy of Kazakhstan
13	Foreign policy of Tajikistan
14	Foreign policy of Turkmenistan
15	Political Islam in Central Asia: Post Independence Revivalism

Appendage 3003**BBA & MBA Programmes - Introduction of New Electives****Background:**

In the wake of the changing work environment in the country, there is a need to equipped students with the knowledge and skills which are in demand. Besides, curriculum updating is a regular feature of any university. In the light of these realites, faculty of management sciences has suggested that the new elective courses which are in demand of industry should be introduced at the MS-department. Accordingly, new courses in BBA/MBA curriculum are being recommended for inclusion:

- | | |
|-----------------------------|-------------------------------------|
| a) Product Management | (Marketing) |
| b) Distribution Management | (Marketing/Supply Chain Management) |
| c) Digital Analytics | (Marketing/MIS) |
| d) Introduction to Big Data | (MIS) |
| e) Electronic CRM (E-CRM) | (Marketing/MIS) |

The detailed course outlines are attached.

HR Implications: Nil.

Financial Implications: Nil.

Discussion

The new course offerings were discussed in detail. HOD MS BUIC sought clarification of the course being electives or general. It was clarified by HOD MS BUKC that these are electives. Further it was added by the sponsor that the added advantage of offering these courses will be diversification of our programs which will add dynamism to our BBA and MBA programs. The house agreed that it should be mentioned in the agenda point that these are the elective courses.

Conclusion

The point was discussed in combined meeting of FBOS of all campuses of Bahria University. The input was obtained from all the campuses. There is a consensus that the new courses for updating curriculum and discipline are essential. And the suggested courses may be approved by the ACM.

Recommendations:

Hence, it is recommended that the agenda item may be approved by the worthy house

COURSES OUTLINES**Course: PRODUCT MANAGEMENT**

Session	CHAPTERS TAUGHT
Week 1	Definitions in product management
Week 2	Classifications in product management
Week 3	Key success factors in product management.
Week 4	The professional Product Manager
Week 5	The Product Management Tools
Week 6	Product, Price, Place and Publicity Product Quality and Product Benefit
Week 7	Product Positioning and Portfolio Management Product Pricing for profitable growth
Week 8	Product Distribution and market success

Week 9	Product Communication and target groups Success factors of product management tools
Week 10	Product strategies for growth
Week 11	Product analysis and product objectives
Week 12	Product plan and product implementation
Week 13	Product investment and product controlling
Week 14&15	The product investment and how to track the product success PROJECT PRESENTATIONS

Text Book:

Products Management, Merle Crawford and Anthony DiBenedetto, 10th edition, ISBN# 978-0-07-340480-6

Course: DISTRIBUTION MANAGEMENT

Session	CHAPTERS TAUGHT
Week 1	Introduction to Distribution Management <ul style="list-style-type: none"> • Overview of the course • Understanding some key terms and concepts.
Week 2	Understanding Channel Intermediaries <ul style="list-style-type: none"> • Role of the intermediary. • Evolution of channel structures. • Reverse distribution. • Distributor & retailer management
Week 3	Channel designing & multi-channel marketing <ul style="list-style-type: none"> • Channel designing approach. • Framework for taking Channel Decisions. • Multi-channel designs. • Dilemmas in channel correction. • Make or buy decision in channel management.
Week 4	Managing Marketing Channels <ul style="list-style-type: none"> • The need for channel management. • Channel conflict. Channel Power. • Operational issues in channel Management
Week 5	Physical distribution <ul style="list-style-type: none"> • Tradeoff's involved. • Total system cost approach.
Week 6	Legal aspects of channel management <ul style="list-style-type: none"> • Sale of goods act. • Contract act • Restrictive trade practice.
Week 7	Measuring - Marketing Channel Performance. <ul style="list-style-type: none"> • Effectiveness • Equity • Efficiency • Tracking Mechanisms • Case Study (Evergreen Products)
Week 8	Introduction to Distribution Sales Force Management <ul style="list-style-type: none"> • Objectives of Sales Management • Interface of Sales with different functions.

	<ul style="list-style-type: none"> Theories of Selling AIDAS theory Buying formulae Need Satisfaction Selling Features V/S Benefits.
Week 9	<p>Sales Target Setting</p> <ul style="list-style-type: none"> Setting Sales Objectives Sales forecasting Policies which affect sales Knowledge of technology
Week 10	<p>Sales force Design</p> <ul style="list-style-type: none"> The Sales Executive Functions Qualities required
Week 11	<p>Sales Force Management</p> <ul style="list-style-type: none"> Personnel management Recruitment Training Programs Sales force Motivation Personal relationship in channel management (Case let: Relationship in Business) Evaluation of performance. Upward Delegation – To Do V/S Get Done (Case let: Home Needs) Sales Incentive (Case let: Universal Automotive)
Week 12	<p>Sales The nature of leadership</p> <ul style="list-style-type: none"> Sales Budgets Sales Territories Sales force conflicts (Case let: Cold air India). Credit controls. Trade Communications. Sales Reporting & Monitoring People Management skills Common Malpractices.
Week 13	<p>EVALUATION OF SALES PERFORMANCE</p> <ul style="list-style-type: none"> Performance Appraisals Performance Appraisals relation to behavior Performance Appraisals processes and procedures
Week 14&15	PROJECT PRESENTATIONS

Text Book:

- Marketing Channels by Louis W. Stern, Adel I. El-Ansary & Anne T. Coughlan (to be given as text book).
- Marketing Channel Management by Pingali Venugopal.
- Sales Management by Richard R. Still, Edward W. Cundiff & Norman A.P. Govoni.

Course: INTRODUCTION TO BIG DATA**Course ID:** MKT 689: BBA / MBA**Course Schedule:** DBMS

WEEK WISE COURSE DISTRIBUTION

Week	Topics
1	<p>Introduction (instructor, course, rules/regulations) Fundamentals of Big Data</p> <p>Evolution of Data Management, Understanding the Waves of Managing Data (Creating manageable data structures, Web and content management, Managing big data), Defining Big Data, Building a Successful, Big Data Management Architecture (Beginning with capture, organize, integrate, analyze, and act, Setting the architectural foundation, Performance matters, Traditional and advanced analytics), Big Data Journey</p>
2	<p>Big Data Types</p> <p>Defining Structured Data (Exploring sources of big structured data, Understanding the role of relational databases in big data), Defining Unstructured Data (Exploring sources of unstructured data, Understanding the role of a CMS in big data management), Looking at Real-Time and Non-Real-Time Requirements Putting Big Data Together (Managing different data types, Integrating data types into a big data environment)</p>
3	<p>Big Data Technology Components</p> <p>Exploring the Big Data Stack, Layer 0: Redundant Physical Infrastructure, Layer 1: Security Infrastructure, Interfaces and Feeds to and from Applications and the Internet, Layer 2: Operational Databases, Layer 3: Organizing Data Services and Tools, Layer 4: Analytical Data Warehouses, Big Data Analytics, Big Data Applications</p> <p>Quiz # 1</p>
4	<p>Virtualization and Distributed Computing</p> <p>Basics of Virtualization, The importance of virtualization to big data, Server virtualization, Application virtualization, Network virtualization, Processor and memory virtualization, Data and storage virtualization, Managing Virtualization with the Hypervisor, Abstraction and Virtualization,</p> <p>Implementing Virtualization to Work with Big Data</p>
5	<p>Cloud and Big Data</p> <p>Defining the Cloud in the Context of Big Data, Understanding Cloud Deployment and Delivery Models (Cloud deployment models, Cloud delivery models), Cloud as an Imperative for Big Data, Making Use of the Cloud for Big Data, Providers in the Big Data Cloud Market, Amazon's Public Elastic Compute Cloud, Google big data services, Microsoft Azure, OpenStack, Cloud services caveats</p> <p>Quiz # 2</p>
6	<p>Operational Databases</p> <p>RDBMSs Are Important in a Big Data Environment (PostgreSQL relational database), Nonrelational Databases, Key-Value Pair Databases (Riak key-value database), Document Databases (MongoDB, CouchDB), Columnar Databases (HBase columnar database), Graph Databases (Neo4J graph database), Spatial Databases (PostGIS/OpenGEO Suite), Polyglot Persistence</p>
7	<p>MapReduce Fundamentals</p> <p>Tracing the Origins of MapReduce, Understanding the map Function, Adding the reduce Function, Putting map and reduce Together, Optimizing MapReduce Tasks (Hardware/network topology, Synchronization File system)</p> <p>Quiz # 3</p>
8	Hadoop

	Explaining Hadoop, Hadoop Distributed File System (HDFS) (NameNodes, Data nodes), Hadoop MapReduce (data readiness, mapping, Reduce and combine) Quiz # 4
	Mid Term
9	Hadoop Foundation and Ecosystem Building a Big Data Foundation with the Hadoop Ecosystem, Managing Resources and Applications with Hadoop YARN, Storing Big Data with HBase, Mining Big Data with Hive, Interacting with the Hadoop Ecosystem (Pig and Pig Latin, Sqoop, Zookeeper) Quiz # 5
10	Appliances and Big Data Warehouses Integrating Big Data with the Traditional Data Warehouse (Optimizing the data warehouse, Differentiating big data structures from data warehouse data, Examining a hybrid process case study), Big Data Analysis and the Data Warehouse (Rethinking extraction, transformation, and loading), Changing the Role of the Data Warehouse, Changing Deployment Models in the Big Data Era (appliance model, cloud model), Examining the Future of Data Warehouses
11	Big Data Analytics Basic analytics, Advanced analytics, Operationalized analytics, Monetizing analytics, BI Products and Big Data, Studying Big Data Analytics Examples, Big Data Analytics Solutions
12	Text Analytics and Big Data Exploring Unstructured Data, Understanding Text Analytics, Analysis and Extraction Techniques, Putting Your Results Together with Structured Data, Putting Big Data to Use, Text Analytics Tools for Big Data (Attensity, Clarabridge, IBM, OpenText, SAS)
13	Integrating Data Sources Identifying the Data You Need (Exploratory stage, Codifying stage, Integration and incorporation stage), Understanding the Fundamentals of Big Data Integration, Traditional ETL, Understanding ELT, Using Hadoop as ETL Quiz # 6
14	Importance of Big Data to Business Big Data as a Business Planning Tool (Stage 1: Planning with data, Stage 2: Doing the analysis, Stage 3: Checking the results, Stage 4: Acting on the plan), Adding New Dimensions to the Planning Cycle (Stage 5: Monitoring in real time, Stage 6: Adjusting the impact, Stage 7: Enabling experimentation), Planning for Big Data, Transforming Business Processes with Big Data,
15	Big Data Analytics and Business Process Improvement Understanding Companies' Needs for Big Data Analytics, Improving the Customer Experience with Text Analytics, Big Data analytics business value, Using Big Data Analytics to Determine Next Best Action, Preventing Fraud with Big Data Analytics, The Business Benefit of Integrating, New Sources of Data
	Final Examination

Text Book:

Hurwitz, J. (2013). Big data for dummies. Hoboken, NJ: For Dummies, a Wiley brand.

Reference Book(s):

Pierson, L. (2015). Data Science For Dummies (1 edition). Hoboken, New Jersey: For Dummies.

Provost, F., & Fawcett, T. (2013). Data science for business: [what you need to know about data mining and data-analytic thinking] (1. ed., 2. release). Beijing: O'Reilly.

Course: -e-CRM

Course ID:

Week Wise Course Distribution

1 Introduction to CRM

Introduction, Strategic CRM, Operational CRM, Analytical CRM, Where does social CRM fit?, Misunderstandings about CRM, Defining CRM, CRM constituencies, Commercial contexts of CRM, The not-for-profit context – the ‘third sector’, Models of CRM 20

2 Understanding relationships

What is a relationship?, Relationship quality, Why companies want relationships with customers, Customer lifetime value, When might companies not want relationships with customers?, Why customers want relationships with suppliers, Customer satisfaction, loyalty and business performance, Relationship management theories,

3 Managing the customer lifecycle – customer acquisition

Introduction, What is a new customer?, Portfolio purchasing, Prospecting, Key performance indicators of customer acquisition programmes, Making the right offer, Operational CRM tools that help customer acquisition,

4 Managing the customer lifecycle – customer retention and development

Introduction, What is customer retention?, Economics of customer retention, Which customers to retain?, Strategies for customer retention, Positive customer retention strategies, Context makes a difference, Key performance indicators of customer retention programmes, The role of research in reducing churn, Strategies for customer development, Strategies for terminating customer relationships.

5 Customer portfolio management

What is a portfolio?, Who is the customer?, Basic disciplines for CPM, CPM in the business-to-business context, Customer portfolio models, Additional customer portfolio management tools, Strategically significant customers, The seven core customer management strategies.

6 How to deliver customer-experienced value

Understanding value, When do customers experience value?, Modelling customer-perceived value, Sources of customer value, Customization, Value through the marketing mix,

7 Managing customer experience

What is customer experience?, Customer experience concepts, How to manage customer experience, What distinguishes customer experience management from customer relationship management?, How CRM software applications influence customer experience.

8 Sales force automation

What is SFA?, The SFA eco-system, SFA software functionality, SFA adoption, How SFA changes sales performance.

9 Marketing automation

What is marketing automation?, Benefits of marketing automation, Software applications for marketing.

10 Service automation

What is customer service?, Modelling service quality, Customer Service Excellence certification, What is service automation?, Benefits from service automation, Software applications for service

11 Developing and managing customer-related databases

Corporate customer-related data, Structured and unstructured data, Developing a customer-related database, Data integration, Data warehousing, Data marts, Knowledge management.

12 Using customer-related data

Analytics for CRM strategy and tactics, Analytics throughout the customer lifecycle, Analytics for structured and unstructured data, Big data analytics, Analytics for structured data, Three ways to generate analytical insight, Privacy issues.

13 Planning to succeed

The logic of the business case , Organizing for benefits, Network and virtual organizations, Person-to-person contacts, Key account management.

14 Implementing CRM

Phase 1: Develop the CRM strategy, Phase 2: Build CRM project foundations, Phase 3: Needs specification and partner selection, Phase 4: Project implementation, Phase 5: Performance evaluation.

Course: Digital Analytics

Course ID: MKT 689: BBA / MBA

Course Description:

Digital analytics (also called web analytics) is the measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage. It can be used as a tool for business and market research, and to assess and improve the effectiveness of a website and to understand online consumer behavior. Web analytics applications are capable of both off-site analytics (website's potential audience, visibility, and trend) and on-site analytics (measuring and analyzing online consumer behavior). It helps one to estimate how traffic to a website changes after the launch of a new advertising campaign.

Learning Objectives

1. To learn to measure and optimize digital marketing strategies based on the digital analytics data collected
2. To learn how to leverage the information gathered from analytics tools to achieve business objectives
3. To understand how successful tech giants have applied and are utilizing digital analytics to succeed

Learning Outcomes

After having completed this course successfully, participants will be able to:

1. Use the basic features of Google Analytics including how to create an account, implement tracking code, analyze basic reports, and set up goals and campaign tracking.
2. Utilize Google Analytics features including data collection, processing and configuration, and more complex analysis and marketing tools.
3. Use Enhanced Ecommerce reports in Google Analytics to make informed ecommerce business decisions.
4. Using Google Tag Manager to simplify tag implementation and management process
5. Facebook Pixel integration for data analytics integration with Google

Week Wise Course Distribution

Week	Topics
1	Introduction (instructor, course, rules/regulations) Google Analytics for Beginners - I Introducing Google Analytics, Why digital analytics, How Google Analytics works, Google Analytics setup, How to set up views with filters
2	Google Analytics for Beginners – II The Google Analytics layout, Navigating Google Analytics, Understanding overview reports, Understanding full reports, How to share reports, How to set up dashboards and shortcuts
3	Google Analytics for Beginners – III Basic Reporting, Audience reports, Lesson 2: Acquisition reports, Behavior reports
4	Google Analytics for Beginners – IV Basic Campaign and Conversion Tracking, Measuring Custom Campaigns, Tracking campaigns with the URL Builder, Using Goals to measure business objectives, Measuring AdWords campaigns Quiz # 1 – Google Analytics Certification
5	Advanced Google Analytics – I Data Collection and Processing, Google Analytics data collection, Categorizing into users and sessions, Applying configuration settings, Storing data and generating reports, Creating a measurement plan
6	Advanced Google Analytics – II Setting Up Data Collection and Configuration, Organize your Analytics account, Set up advanced filters on views, Create your own Custom Dimensions, Create your own Custom Metrics, Understand user behavior with Event Tracking, More useful configurations
7	Advanced Google Analytics – III Advanced Analysis Tools and Techniques, Segment data for insight, Analyze data by channel, Analyze data by audience, Analyze data with Custom Reports
8	Advanced Google Analytics – IV Advanced Marketing Tools, Introduction to remarketing, Better targeting with Dynamic Remarketing, Course Summary Quiz # 2 – Google Analytics Certification
	Mid Term
9	Ecommerce Analytics: From Data to Decisions – I Introduction to Ecommerce Analysis, Course overview, Using the measurement plan, Reporting vs. analysis, Analysis preparation
10	Ecommerce Analytics: From Data to Decisions – II Understanding Customers, Traffic source analysis, Multi-channel analysis, Customer profile analysis, Summary and takeaways
11	Ecommerce Analytics: From Data to Decisions – III Understanding Shopping Behavior, Enhanced Ecommerce overview, On-site merchandising analysis, Shopping behavior analysis, Checkout analysis Quiz # 3 – Google Analytics Certification
12	Google Tag Manager Fundamentals – I Starting out with Google Tag Manager, Course Introduction, Start with a measurement plan, Develop a tag implementation strategy, Tag Manager overview
13	Google Tag Manager Fundamentals – II Setting up Google Tag Manager, Install the Google Analytics tag, Set up a GA Property variable, Set up cross-domain tracking, Understand the Data Layer
14	Google Tag Manager Fundamentals – III

	Collecting data using the Data Layer, variables, and events, Pass static values into Custom Dimensions, Pass dynamic values into Custom Metrics, Track events with variables
15	<p>Google Tag Manager Fundamentals – IV</p> <p>Using additional tags for marketing and remarketing, Set up AdWords conversion tracking, Set up Dynamic Remarketing, Course Review</p> <p>Quiz # 4 – Google Analytics Certification</p>
	Final Examination

Text Book:

Ahlou, F., Asif, S., & Fettman, E. (2016). Google analytics breakthrough: from zero to business impact. Hoboken, New Jersey: John Wiley.

Reference Book(s):

Clifton, B. (2012). Advanced Web Metrics with Google Analytics (3 edition). Indianapolis, Ind: Sybex.

Appendage 3004**PROPOSED COURSE MATRIX - BS(SCM) FOR GL(LOG) CLASSES AT PN L&M SCHOOL**

Sem	1	2	3	4	5	6	7	CR HRS	CONT HRS
1	(2-0) Islamic Studies	(2-0) Comm & IP Skills	(2-0) Pakistan Studies	(2-0) Eng Literature	(3-0) Management			11-0	0-11
2	(3-0) Software Applications in Business	(3-0) Applied Maths for Business-I	(3-0) Theories of Personalities	(3-0) Ethics	(3-0) Sociology			15-0	0-15
3	(3-0) Oral Communication	(3-0) Applied Maths for Business-II	(3-0) Organizational Theory & Behaviour	(3-0) Management Info System	(3-0) History			15-0	0-15
	PHASE-II		Intership (0-0)					0-0	0-0
4	(3-0) Principles of Economics	(3-0) Principles of Marketing	(3-0) Business Statistics	(3-0) E-Commerce	(3-0) Business Communication	(3-0) Financial Accounting		18-0	0-18
5	(3-0) Marketing Management	(3-0) Fundamentals of Finance	(3-0) Fundamental of Supply Chain Management	(3-0) Statistical Inference	(3-0) Human Resource Management	(2-0) Critical Reasoning & Logic		17-0	0-17
6	(3-0) Financial Management	(3-0) Pakistan Economy	(3-0) Theories of Globalization	(3-0) Business Law	(3-0) Research Methods & Techniques	(3-0) Cost & Managerial Accounting	(0-0) SHE Workshop	18-0	0-18
7	(3-0) Project Management	(3-0) Strategic Management	(3-0) Total Quality Management (Elective-I)	(3-0) Procurement Management (Elective-VI)	(3-0) Socio Economic Philosophy of Islam	(3-0) Operation Research		18-0	0-18
8	(3-0) International Relations & Law	(3-0) Naval Law & General Regulations	(3-0) Logistics Management (Elective-III)	(3-0) Freight & Transportation Management (Elective-II)	(3-0) Applied financial Management	(3-0) Research Project*		18-0	0-18
*previously "Logistics & Secretariat Management" course							TOTAL	130-0	0-130

Teaching Methods

- Lecture
- Class discussion
- Case studies
- Group Activities

Learning Strategies Heuristic method of teaching will be followed by making rich use of animation, diagrams, audio visual aids, case studies, exercises, role plays, group activities, article reviews etc. Students are expected to participate positively in all such activities. All such activities will be considered as marked assignments.

Grading Plan:

Activities	Total Frequency	Total Exempted	Marks/ Frequency	Total Marks
Mid Term Paper	1	0	25	25
Final Paper	1	0	40	40
Quiz	4	1(N-1)	5	15
Project Report, Presentation, Assignment, Class Participation.	3	0	9+6+5	20
			Total Marks	100

Course Outlines for Newly Inducted CoursesCourse Title: **Pakistan Economy**

Course Code: PEC 510

Credit Hours: Three

Semester: 7th Semester

Prerequisite: Basic Economics

Aim and Objectives This course looks at the process of economic policy formulation and implementation in Pakistan. It also includes changing policy perceptions and strategies at different stages of the country's economic growth since 1947. Some key policy issues relating both supply and demand management presently facing the country will also be covered.

Contact Hrs/ Period(s)	Lecture Outline
1 2-3	Introduction Pakistan in the world economy
4-6 7-9 10-12 13-15	Economic Framework Agriculture Sector Manufacturing Sector Financial Sector Balance of Payment
16-17 18-19 20-21 22-23 24-25	Infrastructural services Health Education Transport Communication Energy Resources
26 27-29 30-32 33-35 36-38 39-40 41-43 44-45 46-48	Economic Planning and Policies Monetary Policies Introduction to monetary policies Monetary policy: its Tools, objectives, effectiveness and banking Money and capital market Monetary policy as operative in Pakistan Fiscal Policies Objectives and tools of fiscal policy Various types of taxes and their economic implications Budget as an instrument of fiscal policy Deficit financing
	Economic Manifesto for Pakistan

Recommended Text Books

1. Monetary Theory and Public Policy. Lahore: International (Pvt.) Limited, 1996 by Hashmi.
2. Economic Development of Pakistan. Lahore: Publishers United, 1993 by Akhtar.
3. Management of Pakistan's Economy. Oxford University Press by Amjad, Rashid and Viqar Ahmad.
4. Money and Banking in Pakistan. Karachi: Oxford University Press, 1984 by Meenai.

Other Resources

News Papers

- Dawn (economic review section)
- Daily Business Recorder
- Pakistan & Gulf Economist
- Economist

Web

- www.dailytimes.com.pk
- www.adb.org
- www.economist.com

Introduction to Sociology

Course ID: Section 3E & 3G Semester Spring

Year 2017

Course Pre-requisite: None

Course Description:

This course introduces the basic concepts of sociology, relationship between individuals, culture and society, the influence of social and cultural forces on individual's experience and social behavior. Particular emphasis will be laid on making analytical connections between social theory and its application, along with the importance of providing clear, informed and consistent reasoning in the presentation of arguments. The purpose of this course is to develop understanding, and the ability to predict and control / manage human behavior in organization.

Course Objectives:

The objective of this course is to:

- I. Analyze the individual's personal experiences using the sociological perspectives and imagination;
- II. Apply sociological concepts to the analysis of social issues and problems prevailing in Pakistani society;
- III. Explain the effects that social forces and social institutions have on individual and group behavior in our society;
- IV. Understand the main features of different sociological systems;
- V. Evaluate the procedure and tools of sociological research.

Learning Outcomes:

After having completed this course successfully, the students will be able to:

- I. Distinguish between macro level and micro level sociological perspectives. Demonstrate an understanding of the three major theoretical perspectives (Conflict, Functionalism and Symbolic Interaction) employed in the study of social problems.
- II. Identify various research designs and their appropriate application to the study of social life.
- III. Describe the role of culture and social structure in shaping individual lives and be able to provide and recognize examples of this process.
- IV. Describe how sociology differs from and is similar to other social sciences and give examples of these differences and similarities.

V. Express sociological ideas clearly and coherently both in writing and in oral presentations.**CLASS WISE COURSE DISTRIBUTION:**

Class	Topics	Activities
1.	 Introduction to the course. <ul style="list-style-type: none"> • Defining sociology • Subject matter of sociology: • Understanding the Society and Individuals: • Significance of Sociology: • Relationship of sociology with other social sciences: 	<ul style="list-style-type: none"> • Video clip: Pakistan- Culture and Traditions. • Video clip reference : http://www.dailymotion.com/video/x1twvxr_pakistan-culture-and-traditions_travel. • Video Theme: This video shall provide a good introduction of a society. In this clip we shall see different colors of Pakistani society whereas meanings of the terms Society, Individuals, family, festivals and cultures will be clear to the students. • Home Assignment: Students have to analyze the case "<i>INTELLIGENCE</i>", and answer the given questions. Students have to present this case study in groups in the next class. • Source: http://listverse.com/2010/08/02/10-cases-of-natural-gender-inequality/
2.	<ul style="list-style-type: none"> • 3-Sociological perspectives: <ul style="list-style-type: none"> I. Structural-functional II. Social conflict III. Symbolic-interaction 	<ul style="list-style-type: none"> • Home Assignment Presentation: Students are to present the case "<i>INTELLIGENCE</i>" given in the previous class. • Class Activity: <i>Students will solve the Activity No. 4 and 5 from the section Applications and Exercises given in the end of the first chapter of the Macionis'stext.</i> • Source: John J. Macionis - Sociology (14th ed.) - 2012. • Home Assignment: <i>Interact with a friend/family member. Show him/her some of the ambiguous pictures which you have already drawn on your notebook and note the first perception about these pictures.</i>
3.	<ul style="list-style-type: none"> • Benefits of the sociological perspectives: • Sociological imagination: 	<ul style="list-style-type: none"> • Home Assignment Presentation: Students have to present their findings regarding the assignment given in the previous class. • Class Activity:<i>Students will Share their feelings regarding different views of social classes, existing in our society.</i>
4.	 Origins and Development of Sociology: <ul style="list-style-type: none"> ○ <i>Auguste Comte.</i> • Two divisions of Sociology: <ul style="list-style-type: none"> I. Social statics/Social structure II. Social dynamics/Social progress 	<ul style="list-style-type: none"> • Home Assignment: <i>An analysis on the Comte's essay "High priest of positivism"</i> • Video clip: Gilded Moment: Life and Art at the End of the Nineteenth Century. • Video clip reference : https://www.youtube.com/watch?v=f5Wc8N_8jN0 • Video Theme: This video shall help students to understand the situation of the end of 19th century in Europe especially France where Auguste Comte

		and Émile Durkheim were living. Students shall comprehend the meanings of development and the changing social structure.
5.	<ul style="list-style-type: none"> ○ Max Weber. ● Theories on authority: <ul style="list-style-type: none"> I. Traditional authority II. Rational legal authority III. Charismatic authority ● Bureaucracy: <ul style="list-style-type: none"> I. What is Bureaucracy II. characteristics of bureaucracy 	<ul style="list-style-type: none"> ● Class Activity: Video presentation: Social Power/Authority Theory: Definition of Weber's Avenues to Social Power ● Video clip reference : <ul style="list-style-type: none"> 1. https://study.com/academy/lesson/social-power-theory-definition-of-webers-avenues-to-social-power.html 2. http://www.proxery.com/process.php/_2FUFYwn/m4xY_2FD/vyuEtB_2/B89T5f3d/VgnuK5Ho/Jb8netuK/G3Cg0Z39/el/b7/ ● Video Theme: These video will help students to understand the different shades of authority and the ways bureaucracy handles their affairs. ● Home Assignment: <ul style="list-style-type: none"> ➤ Write a comprehensive note based on: <i>"Personal/self-experience when you have exercised any type of authority to control the unaccepted behavior of their younger brother/sister in family Institution".</i>
6.	<ul style="list-style-type: none"> ○ Emile Durkheim. ● Theories on Suicide: <ul style="list-style-type: none"> I. Egoistic suicide II. Anomic suicide III. Altruistic suicide IV. Fatalistic suicide 	<ul style="list-style-type: none"> ● Home Assignment Presentation: Students have to present their findings regarding the assignment given in the previous class. ● Home Assignment: Suicide: Suggested reading: "The Sorrows of Young Werther" is an autobiographical novel by famous German writer Johann Wolfgang von Goethe. The story follows the life and sorrows of Werther after he falls desperately in love with a young woman who is married to another. This ends with an unmatched suicide tragedy. It will help to build some literary taste in students and find some causes behind suicide cases. A lengthy video of the novel may also be recommended to students. ● Source: https://archive.org/details/TheSorrowsOfYoungWerther
7.	 Social Research: <ul style="list-style-type: none"> ● Research terminologies: <ul style="list-style-type: none"> I. Variables II. Hypothesis 	<div style="background-color: yellow; padding: 5px; text-align: center;">QUIZ # 01</div> <ul style="list-style-type: none"> ● Class Activity: <ul style="list-style-type: none"> ➤ Prepare/make a list of independent & dependent variables. ➤ Prepare/make at least 05 alternative & 05 null hypothesis. Home Assignment: Presume a social problem and fill up the given sheet with the help of information related to social research discussed in class.
8.	<ul style="list-style-type: none"> III. Sampling IV. Questionnaire 	<ul style="list-style-type: none"> ● Home Assignment presentation:

	<ul style="list-style-type: none"> The scientific method of investigation / Research methodology/Steps involved in the research process: 	<p>Students have to present their findings regarding the assignment given in the previous class.</p> <ul style="list-style-type: none"> Class Activity: ➤ <i>Prepare/make at least 05 open ended & 05 closed ended questionnaire</i> Home Assignment: ➤ <i>Select any socio-economic issue prevailing in Pakistan. Analyze the issue with all the necessary research steps required.</i>
9.	 Social interaction and Social processes: <ul style="list-style-type: none"> Nature & approaches to social interaction 2-types of social interaction: <ul style="list-style-type: none"> I. Physical interaction II. Symbolic interaction 3- situations for social interaction: <ul style="list-style-type: none"> I. Person to person II. Person to group III. Group to group 	<ul style="list-style-type: none"> Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding research process. Home Assignment: Students have to analyze the case "<i>COMMUNICATION SKILLS</i>", and answer the given questions. Students have to present this case study in groups in the next class. Source: https://docs.google.com/document/d/1eXrkjmzAgq5Rjq_hcaLw26_Du4QzqXJMw2-DIPF4RUK/edit#heading=h.649ef5d1ae24
10.	<ul style="list-style-type: none"> Classification of social processes: <ul style="list-style-type: none"> a) <i>Based on formation:</i> <ul style="list-style-type: none"> I. Universal or basic social processes: Cooperation: 3-Types of cooperation: <ul style="list-style-type: none"> I. Informal cooperation II. Formal cooperation III. Symbolic cooperation Functions of cooperation Competition: 2-Types of competition: <ul style="list-style-type: none"> I. Personal Competition II. Impersonal Competition Functions & importance of competition: 	<ul style="list-style-type: none"> Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding social interaction. Class Activity: ➤ <i>"Students will share personal/self-experience regarding basic social processes such as cooperation, competition or conflict".</i> This activity is a good way to understand the basic sociological ideas including their practical form.
11.	<ul style="list-style-type: none"> Conflict: 2-forms of conflict: Functions of conflict: Derived social processes: <ul style="list-style-type: none"> a. Acculturation b. Assimilation c. Amalgamation d. Differentiation e. Accommodation 	<ul style="list-style-type: none"> Class Activity:Video presentation: The video is related to different modes of conflict in society and presumes some ways to resolve. Video clip reference : <ul style="list-style-type: none"> 1.http://www.proxy.com/process.php/rFhla4yl/nPwdyUE8/lspQKNM/tdF_2Bnv/GE_2Bhdl/Sv1EWO1/_2BZWqrIB/7Z/b7/ 2.http://www.proxy.com/process.php/rFhla4yl/nPwdyUE8/lspQKNM/tdF_2Bnv/GE_2Bhdl/SttdVNEz/BIXotRSg/b7/ Video Theme: These videos are related to different shades of conflict which help students to know the ways of these conflicts.

12.	<ul style="list-style-type: none"> • 5- types of accommodation: b) Based on unity or opposition: <ul style="list-style-type: none"> I. Conjunctive social processes II. Disjunctive social processes 	<ul style="list-style-type: none"> • Home Assignment: Students have to analyze the article "<i>10 Tips for Improving Social Interaction</i>", and answer the given questions. Students have to present their analyses in groups in the next class. • Source: http://www.groco.com/article/american_taking_monyform_its_new_citizens.aspx • Class Activity: Students will be asked to share their experiences related to different forms of social processes e.g. Accommodation Pact, Compromise, Mediation, Conciliation. Those are already discussed in classroom.
13.	 Social groups and Organizations: <ul style="list-style-type: none"> • Understanding groups • Elements/Conditions/Components of group formation: • Characteristics of social group: 	<ul style="list-style-type: none"> • Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding "<i>10 Tips for Improving Social Interaction</i>" • Class Activity: <i>Students will solve the Activity No. 1 from the section Applications and Exercises given in the end of the 7th chapter of the Macionis's text.</i> • Source: John J. Macionis - Sociology (14th ed.) - 2012.
14.	<ul style="list-style-type: none"> • Types/classification of social groups :  (<i>According to social ties</i>) <ul style="list-style-type: none"> • Primary & secondary groups • The continuum from primary to secondary group  (<i>According to self-identification</i>) <ul style="list-style-type: none"> • In-group, out group & reference/psychological group  (<i>According to purpose</i>) <ul style="list-style-type: none"> • Special interest groups, task groups, & influence or pressure groups 	QUIZ # 02 <ul style="list-style-type: none"> • Home Assignment: Students have to analyze the article "<i>10 Tips to Enhancing Your Leadership Skills</i>"., and answer the given questions. Students have to present their analyses in groups in the 16th class. • Source: http://www.groco.com/article/america_taking_monyfrom_its_new_citizens.aspx
15.	 (<i>According to geographical allocation and degree or quality of relationship</i>) <ul style="list-style-type: none"> • Gemeinschaft: (Community) • Gessellschaft: (Society)  (<i>According to form of organization</i>) <ul style="list-style-type: none"> • Formal, informal & relationship groups • Functions of group: 	<ul style="list-style-type: none"> • Home Assignment: Students have to analyze the case <i>LEADERSHIP ATTRIBUTES</i>, and answer the given questions. Students have to present their analyses in groups in the 17th class. • Source: https://docs.google.com/document/d/1eXrkjmzAgq5Rjq_hcaLw26_Du4QzqXJMw2-DIPF4RUk/edit#heading=h.649ef5d1ae24 • Class Activity: <i>Students will solve the Activity No. 2 from the section Applications and Exercises given in the end of the 7th chapter of the Macionis's text.</i> • Source: John J. Macionis - Sociology (14th ed.) - 2012.

16.	MIDTERM EXAMINATION			
17.	<ul style="list-style-type: none"> • Group leadership: • 2-types of group leadership: <ul style="list-style-type: none"> I. Instrumental leadership II. Expressive leadership • Qualities of a leader: • 3-styles of decision making: 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #f2e0e0; width: 10%; padding: 2px;">Midterm Exam Result</td><td style="width: 90%; padding: 2px;"></td></tr> </table> <ul style="list-style-type: none"> • Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding <i>leadership Skills</i>. 	Midterm Exam Result	
Midterm Exam Result				
18.	<ul style="list-style-type: none"> • Understanding organizations: • Main features of social organizations: <ul style="list-style-type: none"> I. Unanimity among the members of society II. Promptness in accepting status & roles III. Control of activities of individuals in society 	<ul style="list-style-type: none"> • Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding LEADERSHIP ATTRIBUTES. • Class Activity: Video presentation: The video is related to different features of social organizations • Source: http://www.proxy.com/process.php/6_2FvRr/_2F42SUFJ/_2FGtT06/KgBW13s4/hLAootTT/6Uk8jENv/lsxWiu01/A0lk6_2B/1TfgAo2P/GkD4h_2B/eGkxuLGU/W0QLBW0k/Sdeyi24p/ffXmrOJI/a9xQ_3D/_3D/b7/ • Video theme: This video provides a brief introduction to the sociological terms of roles and status. 		
19.	GUEST SPEAKER SESSION			
20.	<ul style="list-style-type: none"> • Formal organization: • Characteristics of formal organization: • 3-Types of formal organization: <ul style="list-style-type: none"> I. Normative organizations /Voluntary associations II. Coercive organizations III. Utilitarian organizations 	<ul style="list-style-type: none"> • Class Activity: Students will be asked to draw a list of differences and similarities between public sector organizations and private sector organizations in your own city. This will better help them understand the different types of organizations with their features. 		
21.	 Culture: <ul style="list-style-type: none"> • Important definitions of culture • 2-Categories/Aspects of culture: • Relationship between cultural aspects: • Cultural Lag: • 4-Components of culture: • Characteristics of culture: 	<ul style="list-style-type: none"> • Video: Pakistani culture. • Source: http://www.pakfiles.com/watch-pakistans-culture-447 • Video theme: <i>This video is related to different shades of Pakistani culture. It will also describe components and characteristics of culture.</i> • Home Assignment: Students have to analyze the <i>Scholarly Article "Diversity: No Longer Just Black and White"</i> and answer the given questions. Students have to present their analyses in groups in the next class. • Source: http://www.groco.com/article/america_taking_monyfrom_its_new_citizens.aspx 		
22.	<ul style="list-style-type: none"> • 3-Types of norms: 	<ul style="list-style-type: none"> • Class Activity: 		

	<p>I. Folkways-</p> <p>II. Mores-</p> <p>III. Laws-</p> <ul style="list-style-type: none"> • 2-Attitude towards cultural variation: i. Ethnocentrism ii. Xenocentrism 	<p>1. Students will recall symbols from any section of the society and their particular meanings.</p> <p>2. <i>Students will solve the Activity No. 1 from the section Applications and Exercises given in the end of the 3rd chapter of the Macionis's text.</i></p> <ul style="list-style-type: none"> • Source: John J. Macionis - Sociology (14th ed.) - 2012. • Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding Ethnocentrism and Xenocentrism
23.	<ul style="list-style-type: none"> • Cultural diversity: I. Subculture II. Counterculture • Transmission of culture: 	<ul style="list-style-type: none"> • Video: Cultural diversity • Source: http://playit.pk/watch?v=WcEfzHB08QE • Video theme: <i>This video is helpful in understanding the cultural differences. Students may add few similar pieces of information related to this subject.</i> • Home Assignment: Students have to analyze the case "SHYNESS", and answer the given questions. Students have to present this case study in groups in the next class. • Source: Fulcher & Scott: Sociology 4e, OXFORD Higher Education
24.	 Socialization: <ul style="list-style-type: none"> • Definitions & explanation of socialization • Individual & socialization: • Culture & socialization: • Process of socialization: • Objectives of socialization: • 3-Types of socialization: I. Primary socialization II. Anticipatory socialization III. Re-socialization • Agents of socialization: I. Informal agents II. formal agents • Functions of socialization: 	<ul style="list-style-type: none"> • Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding "SHYNESS". • Class Activity: Video presentation: How To Overcome Shyness - Transform Yourself Into An Extrovert • Source: http://playit.pk/watch?v=hMIRR_vTOXc • Video theme: This video describes 'How to overcome shyness and social anxiety'. These are ideas one can take in start implementing immediately.
25.	 Social mobility: <ul style="list-style-type: none"> • The nature of social mobility • Definitions & explanations • Individual & group social mobility: • 5-Types of social mobility: <ul style="list-style-type: none"> I. Vertical mobility (Upward & downward mobility) II. Horizontal mobility III. Intergenerational mobility 	<p style="text-align: right;">QUIZ # 03</p> <ul style="list-style-type: none"> • Video: Social Lighting & Vertical Mobility • Source: http://playit.pk/watch?v=GckNS5NF2Q4 • Video theme: This video represents movement of an individual through different stages of life. • Home Assignment:

	IV. Intra-generational mobility V. Geographical mobility	Students have to analyze the <i>Scholarly Article "Reward Employees for Teamwork"</i> and answer the given questions. Students have to present their analyses in groups in the next class. ● Source: http://www.groco.com/article/america_taking_monyfrom_its_new_citizens.aspx
26.	<ul style="list-style-type: none"> ● Causes of social mobility: ● Influencing factors of social mobility: ● Resisting factors of social mobility: 	<p style="text-align: center;">SUBMISSION OF TERM REPORTS</p> <ul style="list-style-type: none"> ● Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding "<i>Reward Employees for Teamwork</i>". ● Class Activity: <i>Students will solve the Activity No. 2 from the section Applications and Exercises given in the end of the 11th chapter of the Macionis's text.</i> ● Source: John J. Macionis - Sociology (14th ed.) - 2012.
27.	 Social Change: <ul style="list-style-type: none"> ● The nature and meaning of social change ● Distinction between social change, cultural change & progress: ● Social change & development: ● Social change & society: ● Sources of social change: ● 3-Internal sources of social change/Endogenous <ul style="list-style-type: none"> I. Technical Innovation II. Ideology (Conservative, liberal, & radical ideologies) III. Reactions to institutional inequality 	<ul style="list-style-type: none"> ● Video: The Industrial Revolution ● Source:http://playit.pk/watch?v=OF7-vN-aLOM ● Video theme: This video describes the story of historic social change. The Industrial Revolution was the transition to new manufacturing processes in the period from about 1760 to sometime between 1820 and 1840. ● Home Assignment: Students have to analyze the Scholarly Article "<i>Internet Home Based Business-Is it For You?</i>" and answer the given questions. Students have to present this case study in groups in the next class. ● Source: http://www.groco.com/article/america_taking_monyfrom_its_new_citizens.aspx
28.	<ul style="list-style-type: none"> ● 2-External sources of social change/Exogenous <ul style="list-style-type: none"> I. Diffusion II. Forced acculturation ● Obstacles in the way of social change: <ul style="list-style-type: none"> i. Conservative society ii. Lack of education iii. Lack of means of communication 	<p style="text-align: center;">QUIZ # 04</p> <ul style="list-style-type: none"> ● Home Assignment presentation: Students have to present their findings regarding the assignment given in the previous class. It will help clear their ideas regarding <i>internet world</i>.
29.	 Presentations:	<ul style="list-style-type: none"> ● Students group presentations on their "Term Reports" which were assigned them in the beginning of the semester.

30.	 Presentations:	<ul style="list-style-type: none"> • Students group presentations on their “Term Reports” which were assigned them in the beginning of the semester.
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Course Material: **Text Book:**

- John J. Macionis (2012) *Sociology.14th Edition*, Prentice Hall Inc.

 **Reference Books:**

- I. Richard J. Gelles & Ann Levine,(1995) *Sociology An Introduction.5th Edition*McGraw-Hill, INC.
- II. Anthony Giddens, (2013)*Introduction to Sociology, 9th Edition*.W. W. Norton & Company

 **Additional Reading Material:**

- CASE STUDIES, SCHOLARLY ARTICLES, FORMAT OF TERM REPORT, CASE STUDY & SCHOLARLY ARTICLE IN THE FORM OF BOOKLET AVAILABLE AT PHOTOCOPIER (BAHRIA UNIVERSITY -KARACHI CAMPUS)

 **Important Note:**

- (*Handouts, Case Studies, Scholarly Articles, Home Assignments, etc. shall also be the part of the syllabus*).

Theories of Personality (Self-Management)**Course ID:** HSS207**Course Pre-requisite:** Intro to Psychology**Course Description:**

The Self-Management course is a holistic approach to living a successful and composed life. Self-management is a broad term but encompasses many skills that only come with guidance, training, opportunity and experience. Self-management, as defined by Deakin University Australia, is independent learning, working and taking responsibility for personal actions. Self-management is the act of managing the resources you have under your personal control: your personality, time, image and relationships.

Professional management in management sciences falls under the purview of Self-Management. From graduation until the time students begin to manage projects, teams, and companies, they manage themselves. Those who master the art of self-management are those who rise quickest to management positions.

Course Objectives

1. To gain personal insight, self-awareness, self-confidence.
2. To adapt to particular environments and situations.
3. To reflect on their values, areas of their strengths/weaknesses and work towards amelioration.
4. To enable students to lead life according to habits based on ethical paradigms.

Learning Outcomes

After having completed this course successfully, participants will be able to:

1. Select their values, reflect on them and modify them for positive character building.
2. Set short-term and long-term goals, set priorities and monitor progress.
3. Select time management strategies to submit work on time and to accomplish lifetime goals.
4. Employ techniques for positive thinking and apply behavior modification.
5. Use feedback for self-improvement in a constructive manner.

Weekwise Course Distribution

Wk	Topics	Activities
1.	Introduction to “Self-Management” Introduction to the Course Chapter 1 - Developing Self-Awareness Pages 57-62 (excl. Emotional Intelligence and Values) and pages 74-79 (In each class questionnaire marking will be discussed for the completed questionnaires)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Self-awareness assessment (discussion) 2. Self-awareness assessment 3. Cognitive Style Indicator Test 4. Tolerance of Ambiguity Scale 5. Locus of Control Test <p>Next Class Preparation and Reading: Christensen C. M., 2010. How will you measure Your Life? (HBR)</p> <p>Homework:</p> <ol style="list-style-type: none"> 6. Fill Questionnaire “How Confident am I in My Abilities to Succeed?”
2.	Personal Values, Principles and Values Maturity (Values pages 65-74 from Developing Self Awareness) Rokeach Terminal and Instrumental Values	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss the Confidence in Abilities Questionnaire 2. Determine your personal values (group discussion on Values Maturity Exercise) 3. Determine 5 most important individual work values (each individual) (Use Questionnaire from Job Seeker Guide PDF) 4. Determine your work interests/preferences. (Use Questionnaire from Job Seeker Guide PDF) 5. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings: Drucker P. F., 1999. Managing Oneself (HBR)</p> <p>Introduction to “The 7 Habits of Highly Effective People” Part 1 (Pages 15-44)</p> <p>Homework:</p> <ol style="list-style-type: none"> 1. Positive Qualities Test at: http://www.kent.ac.uk/careers/Choosing/personalstyles.htm 2. Decide personal Rokeach Instrumental and Terminal Values, 5 each.
3.	The 7 Habits of Highly Effective People Introduction Paradigms and Principles (Inside-Out)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Evaluate University of Kent Qualities Test& Rokeach Values. 2. Core Self Evaluation Scale Test 3. Pre-class quiz 4. Discuss reading of Introduction (teacher may nominate a panel for presentation) 5. Discuss 7 Habits Workbook pages 3-7 6. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings:</p>

		<p>Schwartz T. & McCarthy C., 2007. Manage Your Energy, Not Your Time (HBR)</p> <p>Overview "The 7 Habits of Highly Effective People" Part 1 (Pages 46-62)</p> <p>Homework</p> <ol style="list-style-type: none"> 1. Complete 7 Habits Workbook pages 3-7 2. Take Strengths test at: http://richardstep.com/richardstep-strengths-weaknesses-aptitude-test <p>or</p> <p>https://www.kent.ac.uk/careers/Choosing/strengths.htm</p>
4.	The 7 Habits of Highly Effective People The Seven Habits – An Overview	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss progress on Free-Strengths-Test. 2. Questionnaire How Spiritual am I? 3. Pre class quiz 4. Discuss reading of Overview (teacher may nominate a panel for presentation) 5. Discuss 7 Habits Workbook pages 8-21 6. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings:</p> <p>Kegan R. & Lahey L. L., 2001. The Real Reason People Won't Change (HBR)</p> <p>Habit 1 Be Proactive (Pages 66-94)</p> <p>Homework:</p> <ol style="list-style-type: none"> 1. Fill-in 7 Habits Workbook pages 8-21 2. Complete Free-Strengths-Test and submit result http://richardstep.com/richardstep-strengths-weaknesses-aptitude-test <p>or</p> <p>https://www.kent.ac.uk/careers/Choosing/strengths.htm</p>
5.	Habit 1 Be Proactive Principles of Personal Vision	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. EvaluateFree-Strengths-Test and how to use it with the book Strengths Finder 2.0. 2. Pre class quiz 3. Discuss reading of Habit 1 (teacher may nominate a panel for presentation) 4. Discuss 7 Habits Workbook pages 26-39 5. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings:</p> <p>Coutu D. L., 2002. How resilience Works (HBR)</p> <p>Habit 2 Begin with the end in Mind (Pages 96-118)</p> <p>Homework:</p> <ol style="list-style-type: none"> 1. Fill-in 7 Habits Workbook pages 26-39 2. Assignment 1 prepare Personal Strengths Profile
6.	Habit 2 Begin with the end in Mind Principles of Personal Leadership (Up)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss Personal Strengths Profile. 2. Group Activity Strengths Exercise 2 3. Pre class quiz 4. Discuss reading of Habit 2 (teacher may nominate a panel for presentation)

	(to Identifying your Centre)	<p>5. Discuss 7 Habits Workbook pages 41-48 6. Review http://www.kent.ac.uk/careers/sk/skillsmenu.htm 7. Student Group Presentation on HBR article.</p> <p>Next Class Preparation and Readings: Ghoshal S. & Bruch H., 2004. Reclaim Your Job (HBR) Habit 2 Begin with the end in Mind (Pages 118-144) Homework 1. Fill-in 7 Habits Workbook pages 41-48 2. Take Assertiveness Quiz athttp://www.kent.ac.uk/careers/assertiveness.htm</p>
7.	Habit 2 Begin with the end in Mind Principles of Personal Leadership (From Identifying your Centre to the Application Suggestion)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Review Assertiveness Quiz 2. Pre class quiz 3. Discuss reading of Habit 2 (teacher may nominate a panel for presentation) 4. Discuss 7 Habits Workbook pages 48-60 5. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings: Hallowell E. M., 2005. Overloaded Circuits (HBR) Habit 3 Put First Things First (Pages 146-171) Homework:</p> <ol style="list-style-type: none"> 1. Fill-in 7 Habits Workbook pages 48-60 2. Complete questionnaire "How Well Do I Manage Impressions?"
8.	Habit 3 Put First Things First Principles of Personal Management(Up to Delegation) MID-TERM EXAMINATION (Descriptive cum Analytical)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss Managing Impressions 2. Pre class quiz 3. Discuss reading of Habit 3 (teacher may nominate a panel for presentation) 4. Discuss 7 Habits Workbook pages 62-76. 5. Review https://www.mindtools.com/ 6. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings: Habit 3 Put First Things First (Pages 171–182) Paradigms of Interdependence (Pages 185-203) Homework:</p> <ol style="list-style-type: none"> 1. Fill-in 7 Habits Workbook pages 62-76
9.	Habit 3 Put First Things First Principles of Personal Management(fro m Delegation) Paradigms of Interdependence	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Pre class quiz 2. Discuss reading of Habit 3 & Paradigms of Interdependence (teacher may nominate a panel for presentation) 3. Discuss 7 Habits Workbook pages 77-88 <p>Next Class Preparation and Readings: Oncken Jr W. & Wass D. L., 1999. Management Time: Who's Got the Monkey (HBR) Habit 4 Think Win/Win (Pages 205-234) Homework:</p> <ol style="list-style-type: none"> 1. Fill-in 7 Habits Workbook pages 77-88 1. Complete questionnaire "Am I an Ethical Leader?"
10.	Habit 4 Think Win/Win	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss questionnaire "Am I an Ethical Leader?" 2. Pre class quiz

	Principles of Interpersonal Leadership	<p>3. Discuss reading of Habit 4 (teacher may nominate a panel for presentation)</p> <p>4. Discuss 7 Habits Workbook pages 90-99</p> <p>5. Review https://www.mindtools.com/</p> <p>6. Student Group Presentation on HBR article.</p> <p>Next Class Preparation and Readings:</p> <p>Quinn R. E., 2005. Moments of Greatness (HBR)</p> <p>Habit 5 Seek First to Understand, Then to Be Understood (Pages 236-260)</p> <p>Homework:</p> <p>1. Fill-in 7 Habits Workbook pages 90-99</p>
11.	Habit 5 Seek First to Understand, Then to Be Understood Principles of Empathic Communication	<p>Class Room Activities:</p> <p>1. Pre class quiz</p> <p>2. Discuss reading of Habit 5 (teacher may nominate a panel for presentation)</p> <p>3. Discuss 7 Habits Workbook pages 101-115</p> <p>4. Discuss Wonderlic test</p> <p>5. Student Group Presentation on HBR article.</p> <p>Next Class Preparation and Readings:</p> <p>Goleman D., Boyatzis R. & McKee A., 2001. Primal Leadership (HBR)</p> <p>Habit 6 Synergize (pages 262 -284)</p> <p>Homework:</p> <p>1. Fill-in 7 Habits Workbook pages 101-115</p> <p>2. Complete questionnaire, "How Charismatic am I?"</p>
12.	Habit 6 Synergize Principles of Creative Cooperation	<p>Class Room Activities:</p> <p>1. Discuss questionnaire "How Charismatic am I?"</p> <p>2. Pre class quiz</p> <p>3. Discuss reading of Habit 6 (teacher may nominate a panel for presentation)</p> <p>4. Discuss 7 Habits Workbook pages 117-128.</p> <p>5. Student Group Presentation on HBR article.</p> <p>Next Class Preparation and Readings:</p> <p>Kaplan R. S., 2007. What to ask the Person in the Mirror (HBR)</p> <p>Habit 7 Sharpen the Saw (pages 287-319) or split in 2 parts 287-307 and 309-319</p> <p>Homework:</p> <p>6. Fill-in 7 Habits Workbook pages 117-128</p> <p>7. Complete questionnaire "How stressful is my Life?"</p>
13.	Habit 7 Sharpen the Saw Principles of Balanced Self Renewal	<p>Class Room Activities:</p> <p>1. Discuss questionnaire "How stressful is my Life?"</p> <p>2. Pre class quiz</p> <p>3. Discuss reading of Habit 6 (teacher may nominate a panel for presentation)</p> <p>4. Discuss 7 Habits Workbook pages 130-145.</p> <p>5. Student Group Presentation on HBR article.</p> <p>Next Class Preparation and Readings:</p> <p>Walker C. A., 2002. Saving your Rookie Managers from Themselves (HBR)</p> <p>Homework:</p> <p>1. Fill-in 7 Habits Workbook pages 130-145</p>

		2. Complete questionnaire "What's my Face to Face Communication Style?"
14.	Review The 7 Habits of Highly Effective People	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss questionnaire "What's my Face to Face Communication Style?" 2. Pre class quiz 3. Discuss reading of Habit 7 (teacher may nominate a panel for presentation) 4. Discuss 7 Habits Workbook pages 146-171. 5. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings:</p> <p>Gabarro J. J. & Kotter J. P., 1980. Managing Your Boss (HBR) Johnson S., 1998. Who Moved My Cheese?</p> <p>Homework:</p> <ol style="list-style-type: none"> 1. Fill in 7 Habits Workbook pages 146-162 2. Complete questionnaire "Am I likely to become an Entrepreneur?"
15.	Interpersonal Communication and Etiquettes	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Discuss interpersonal communication, email and telephone etiquettes (teacher may nominate a panel for presentation) 2. Discuss readings from, "Who Moved My Cheese?" (The teacher may nominate a panel for presentation) 3. Discuss completion of Workbook. 4. Discuss questionnaire "Am I likely to become an Entrepreneur?" 5. Student Group Presentation on HBR article. <p>Next Class Preparation and Readings:</p> <p>Friedman S. D., 2008. Be a Better Leader, Have a Richer Life (HBR) Read at least 2 guides from Stress and Anger Management Website</p> <p>Homework:</p> <ol style="list-style-type: none"> 1. Complete questionnaire "What are my Attitudes toward Workplace Diversity?"
16.	End of Course Discussion (This class may be required to complete class presentations. Otherwise, can be combined with the 2 previous sessions.) FINAL EXAMINATION (Descriptive cum Analytical)	<p>Class Room Activities:</p> <ol style="list-style-type: none"> 1. Review Seven Habits Workbook 2. Discuss anger and stress management 3. Review questionnaire "What are my Attitudes toward Workplace Diversity?" 4. Discuss Self-Management as Life Long activity. 5. Student Group Presentation on HBR article. 6. Course critique and suggestions for improvement

LEARNING METHODOLOGY

1. In each session, the students will come prepared with allocated readings and completed Questionnaires etc. The facilitator will discuss the allocated pre-class work with the students and explain relevant questionnaire or workbook part. As homework, the student will fill in section in the workbook or the questionnaire. The students will bring completed homework in the next session for discussion and explanations.
2. The students will fill questionnaires online in own time and email to the facilitator. The facilitator will discuss his finding with students.
3. Students will have to bring their own Wi-Fi enabled device in classroom.

COURSE REFERENCE MATERIAL**Text Books:**

Chapter 1 "Developing Self-Awareness" from the Book "Developing Management Skills" 8e, 2011.
 David A Whetten; Kim S. Cameron

The Seven Habits of Highly Effective People, 1989. Stephen R Covey

The Seven Habits of Highly Effective People Personal Workbook, 2003. Stephen R Covey

The Seven Habits of Highly Effective Teens, 1998. Sean Covey

Strengths Finder 2.0, 2007. Tom Rath

HBR's 10 Must Reads on Managing Yourself, 2011

Who Moved My Cheese? 1998. Spencer Johnson

Guides at

https://www.groomassociates.com/pdf/jobseeker_guide.pdf

<http://www.kent.ac.uk/careers/sk/skillsmenu.htm>

<https://www.mindtools.com/>

<http://psychology.tools/stress-and-anger-management-workbooks.html>

ASSESSMENT PLAN

Marks	Frequency	Marks	Total Marks
Panel Discussions	1	30 each	03
Presentations	2	20 each	04
Personal Strengths Profile	1	30	03
The 7 Habits Work Book	12	120	10
Quizzes	12	9 (N-3) = 45	15
Mid Term	1	25	25
Final Paper	1	40	40 Total =100
Total			100
Attending Guest Seminar	1	1 or 0.5 (late arrival)	To be added to Assignment or Quiz marks total
Regular Attendance will be rewarded at the end of Course			

Economics

Course objective: We are studying economics at a time of enormous changes and advancement in e-commerce and technology. These technological changes have transformed our lives – the way we work and play.

Your course in **economics** will help you understand the powerful forces that are shaping our economic world and help you to navigate it in your everyday life and work. In this course, while microeconomics will focus on the behavior of the units—the firms, households, and individuals—that make-up the economy, macroeconomics will make you understand the behavior of your entire economy and the economic and other forces in global perspective that bring changes in the economic and social lives of the people.

Note: Microeconomics will be covered before mid-term Exams and Macroeconomics will be taught after the mid-term exams.

Week/Session (3 Hrs)	Lecture Outlines
Week: 1	<p><u>Chapter: 1What Is Economics:</u></p> <ul style="list-style-type: none"> i. Definitions of economic terms. ii. Two big economic questions iii. The economic way of thinking iv. Economics: A social science
Week: 2	<p><u>Chapter: 2The Economic Problem:</u></p> <ul style="list-style-type: none"> i. Production possibilities and opportunity cost ii. Using resources efficiently iii. Economic growth iv. Gains from trade v. Economic coordination
Week: 3	<p><u>Chapter: 3Demand and Supply:</u></p> <ul style="list-style-type: none"> i. Markets and prices ii. Demand iii. Supply iv. Market equilibrium v. Predicting changes in price and quantity
Week: 4	<p><u>Chapter: 4Elasticity:</u></p> <ul style="list-style-type: none"> i. Elasticities of demand ii. Calculating various elasticities of demand iii. Elasticity of supply i. Calculating the elasticity of supply ii. The factors that influence the elasticity of supply
Week: 5	<p><u>Chapter: 5Efficiency and Equity:</u></p> <ul style="list-style-type: none"> i. Resources and allocation of resources ii. Is the competitive market efficient? <p><u>Chapter: 6Markets in Action:</u></p> <ul style="list-style-type: none"> i. The labor market and minimum wage ii. Taxes iii. Subsidies and quotas iv. Markets for illegal goods
Week: 6	<p><u>Chapter: 9Organizing Production:</u></p> <ul style="list-style-type: none"> i. The firm and its economic problem ii. Technological and economic efficiencies iii. Types of business organizations <p><u>Chapter: 10Output and Costs:</u></p> <ul style="list-style-type: none"> i. Cost and cost curves ii. Calculation of MC, AFC, AVC, ATC etc.
Week: 7	<p><u>Chapter: 11Perfect Competition:</u></p> <p>What is perfect competition</p> <p>Marginal Analysis</p> <p>Profits and losses</p> <p><u>Chapter: 12Monopoly:</u></p> <ul style="list-style-type: none"> i. Monopoly power ii. Price setting strategies and output iii. Discrimination
Week: 8	<p><u>Chapter: 13Monopolistic Competition and Oligopoly:</u></p> <p>What is monopolistic competition?</p> <p>Price and output</p>

	Product development and marketing What is oligopoly? Two traditional oligopoly models
Week: 9	<u>Chapter: 20A First Look at Macroeconomics:</u> i. Economic growth and fluctuation ii. Jobs and unemployment iii. Macroeconomic policy and tools
Week: 10	<u>Chapter: 21 Measuring GDP and Economic Growth:</u> i. Gross Domestic Product ii. Measuring GDP iii. Real GDP and price level iv. The uses and limitations of real GDP
Week:11	<u>Chapter: 22 Monitoring Jobs and Price Level:</u> i. Jobs and wages ii. Types of unemployment iii. Full employment iv. The consumer price index v. Measuring inflation <u>Chapter: 23 At Full Employment: The Classical Model:</u> i. The labor market and potential GDP ii. Loanable funds and the real interest rate iii. Equilibrium in the loanable funds market
Week: 12	<u>Chapter: 24 Economic Growth:</u> i. The basics of economic growth ii. Economic growth trends iii. The sources of economic growth iv. Growth theories (brief discussion) Classical, Neo classical, New growth theory <u>Chapter: 25 & Chapter 31 combined</u> <u>Money, the rice Level and Inflation (Chapter 29 combined)</u> i. What is money ii. Money in Pakistan iii. State Bank of Pakistan iv. How banks create money v. The quantity theory of money vi. Monetary policy objectives vii. The conduct of monetary policy viii. The ripple effects ix. Inflation in Pakistan x. Types of inflation
Week: 13	<u>Chapter: 26 The Exchange Rate and the Balance of Payments:</u> i. Currencies and exchange rates ii. The foreign exchange market iii. Changes in demand and supply iv. Financing international trade v. Exchange rate policies
Week: 14	<u>Chapter: 27 Aggregate Supply and Aggregate Demand:</u> i. The macroeconomic long run and short run ii. Aggregate supply iii. Aggregate demand iv. Macroeconomic schools of thought

Week: 15	Chapter: 30Fiscal Policy: <ul style="list-style-type: none"> i. The federal budget ii. Types of fiscal policy iii. The influence of fiscal policy on the economy
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1) Text Book: Michael Parkin 7th or 8th Edition.

2) Supporting Documents:

- Handouts
- Annual Reports: State Bank of Pakistan
- Economic Surveys: Govt. of Pakistan
- Articles in News papers/Magazines

Theories of Globalization

Course Code: IR 306

Course Objective

The aim of this course is to provide the students with an opportunity to understand the diverse theories of globalization. The course explores perspectives from different academic disciplines: economics, political science, sociology, history, and geography, as well as the popular literature emerging from civil society. The course considers the theoretical sources that underpin various contemporary debates on globalization, for example, free trade versus fair trade, democracy versus capitalism, technological revolution versus ecological risk, consumerism versus fundamentalism, US hegemony versus Europe and Asia, and anti-globalization versus global justice. Ultimately the course will facilitate students developing their own vision of globalization.

Weeks/ Classes/ Hours	Lecture Outline	Objectives	Class Activity
Week 1 1 – 3 class (3 hrs)	Course introduction 1. Globalization : meaning & definition: a) Origin & History of Globalization b) 3 Phases of Globalization i. Archaic ii. Proto iii. Modern	Students should understand the methodology that will be used for the subject. Students should understand the meaning definition and historical background of Globalization	Participative learning Students raise question for clarification
Week 2 4 - 6 class (3 hrs)	1. Globalization: Myth or Reality 2. Advantages and Disadvantages of Globalization	Students should understand actual situation and ground realities of Globalization. They Should be able to analyze advantages & disadvantages of Globalization,	Group presentation by students, questions answer session. Relevant Videos <i>Home Assignment:</i> Bring one article along with summary
Week 3 7 – 9 class (3 hrs)	1. Quiz # 1 2. Globalization and Theories of World Politics (Realism, Liberalism, Marxism, Social Constructivism)	Students should be able to understand and discuss the pros & cons of various international political theories.	Group presentation by students, questions answers session. Relevant Videos

Week 4 10 – 12 class (3 hrs)	1. Economic Globalization 2. The economic dimension of globalization 3. Capitalism Perspective 4. Global Trade and Finance 5. Case Study - Dubai	Students should be able to understand and define role of economics in Globalization and impact of globalization on world economy specially on the economy of developing countries.	Group presentation by students, questions answers session. Relevant Videos
Week 5 13 - 15 class (3 hrs)	1. Globalization and Politics 2. The political dimension of globalization 3. New World Order	Students should be able to understand and discuss different political thoughts and their impact on world affairs.	Group presentation by students, questions answers session. Relevant Videos
Week 6 16 - 18 class (3 hrs)	1. Quiz # 2 2. Contemporary Globalization Issues: 3. Technological Development 4. Case Study	Students should be able to define various contemporary global issues related to technology, specially their impact on less developed countries.	Group presentation by students, questions answers session. Relevant Videos, 10 minutes for group discussion to mention relevant examples Case discussion
Week 7 19 – 21class (3 hrs)	Contemporary Globalization Issues: 1. International Security (in the Wake of Terrorism) 2. Global Politics (Focus on End of Cold War, 9/11 and Post-9/11) 3. Non State Actors	Students should be able to understand and define various contemporary global issues related to security, and role of Non State Actors in world affairs.	Group presentation by students, questions answers session. Relevant Videos

Appendage 3006

FORENSIC PSYCHOLOGY & HEALTH PSYCHOLOGY
Courses Objectives, Content and References

Name of Course: Forensic Psychology

Credit Hours: 03

Course Objectives

The main objective of this course is to provide orientation to the students of the main concept, models, assessment and intervention in forensic setting. It also highlights the contribution of forensic psychologists to the legal system i.e. law enforcement agencies (LEAs), judicial and correctional settings. It trains students in interrogation, assessment and rehabilitation modalities appropriate to the civil and criminal settings and familiarize students with the methods used by forensic psychologists.

Course Content

The course contents include introduction to forensic psychology; ethics and professional issues; understanding legal rights; assessment in forensic setting; role of forensic psychologist in different settings; perpetrator and victim; applying psychology to crime; special applications and communicating expert opinions.

Reference Books

- Bartol, C.R. (2012). *Introduction to forensic psychology*. Los Angeles: SAGE Publications.
- Edi, J.R.A. (2010). *Forensic psychology* (2nd ed.). UK: BPS Blackwell.
- Edi, G.J.T. (2010). *Forensic psychology*. UK: BPS Blackwell.
- Heidensohn, F. (1985). *Women and crime*. London: Macmillan Education Ltd.
- Laurence, S., & Wrightman. (2007). *Forensic psychology*. USA: Belmont.
- Springer, D.W., & Roberts, A.R. (2007). *Handbook of forensic mental health with victims and offenders: Assessment, treatment and research*. New York: Springer Publishing Company L.I.C.
- Towel, G.J., & Crighton, D.A. (2010). *Forensic psychology*. UK: BPS: Blackwell.
- Weiner, B.A., & Hess, A. (2006). *The handbook of forensic psychology* (3rd ed.). New York: Wiley.

Name of Course: Health Psychology

Credit Hours: 03

Course Objectives

The course introduces students to a new emerging branch of psychology. It introduces students to the basic terminology, avenues of research and theoretical models in Health Psychology. It develops an understanding of the application of principles of psychology in learning and developing healthy and unhealthy behaviors. It develops an understanding of the psychological intervention, promoting health behaviors and health enhancements.

Course Content

The course contents include historical background; theoretical models in health psychology; the psychology of health and illness; psychological factors influencing physical health; stress, coping and health; application of health psychology with reference to specific physical ailments and unhealthy life styles; grief and bereavement; working with the community; psychological interventions in health psychology and research in health psychology.

Reference Books

- Bernard, L.C., & Krupat, E. (1994). *Health psychology: Biopsychological Factors in health and illness*. New York: Harcourt Brace College Publishers.

- Brannon, L., & Feist, J. (2004, 2010). *Health psychology: An introduction to behavior and health* (5th ed.). USA: Wadsworth.
- Cockerham, W.C. (1998). *Medical sociology*. New Jersey: Prentice Hall.
- Ewles, L., & Simnett, I. (1989). *Promoting health: A practical guide to health education*. Chichester: John Wiley and Sons.
- Forshaw, M. (2002). *Essential health psychology*. London: Arnold.
- Ogden, J. (2005). *A text book of health psychology* (6th ed.). Open University Press.
- Pearce, S., & Wardle, J. (Eds.). (1989). *The practice of behavioral medicine*. Oxford: BPS Books.
- Sanderson, C.A. (2004). *Health psychology*. USA: Wiley.
- Sanders, G.S., & Suls, J. (Eds.). (1982). *Social psychology of health and illness*. Hillsdale: Lawrence Erlbaum Associates Publishers.
- Spacapan, S., & Oskamp, S. (Eds.). (1988). *The social psychology of health and illness*. London: SAGE Publication.

Appendage 3007**Addition of Courses in BS(CS) and BS(IT) Elective List****Background to the Case**

Due to emerging field of Computer science there is always need of new courses. Based on the market survey and technology demand following courses are recommended in DBOS for the addition in Elective List of BS(CS) and BS(IT) program:

- 1) Big Data Analytics 2) Introduction to Data Science 3) Ubiquitous Computing

Financial Effect

Nil

Recommendations

It is recommended to consider the above courses as an Electives in BS(CS) and BS(IT) program from Spring 2018 semester.

The course outlines agreed upon by all three CS departments are attached

Course Code	CSC-487
Course Title	Introduction to Data Science
Credit Hours	2+1
Degree Program	Bachelor in Computer Science and Information Technology
Prerequisites	None
Textbook	Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014.
Reference Material	<ol style="list-style-type: none"> 1. Cady, Field, "The Data Science Handbook", John Wiley & Sons, 2017. 2. Sinan Ozdemir, "Principles of Data Science", Packt Publishing , 2017. 3. Pierson, Lillian, "Data science for dummies", John Wiley & Sons, 2015. 4. Fischetti, Tony. Data Analysis with R. Packt Publishing Ltd, 2015.
Course Aims	The aim of this course is about to learn from data, in order to gain useful information and knowledge (predictions and insights). Separating useful data from noise presents many computational and inferential challenges, which we approach from a perspective at the interface of computer science and statistics. This course aims to explain the machine learning and visualization techniques for better understanding and analysis of data.
Course Objectives	<ul style="list-style-type: none"> <input type="checkbox"/> To gain a better understanding of the very diverse field of data science <input type="checkbox"/> To get acquainted with the basics of statistics and the R software <input type="checkbox"/> To be able to write small but readable and robust programs to solve different big data problems.
Course Outcomes	<ul style="list-style-type: none"> <input type="checkbox"/> Define and explain the key concepts and models relevant to data science, including data cleaning and integration, data-intensive distributed computing, machine learning algorithms, and data visualization. <input type="checkbox"/> Design, implement, and evaluate the core algorithms underlying an end-to-end data science workflow, including the experimental design, data collection, mining, analysis, and presentation of information derived from large datasets. <input type="checkbox"/> Apply "best practices" in data science, including facility with modern tools.
Course Description	Data is the underlying drivers of the knowledge economy. This course will introduce the practice of data science, foundational knowledge and practical skills about data collection, representation, storage, retrieval, management, analysis, and visualization.

The course will combine technical and statistical skills, analytical thinking, and business acumen. The course will cover R-programming for data science techniques, knowledge discovery and visualization.

Lecture Plan (16 Weeks)

	Topic to be covered	Learning outcomes	Labs
Week 1	Introduction to the course What is Data Science? - Big Data and Data Science hype , getting past the hype , Datafication, Current landscape of perspectives	Outline of course Describe what Data Science is and the skill sets needed to be a data scientist.	Introduction of different tasks
Week 2	Statistical Inference: Populations and samples, Statistical modeling, probability distributions, fitting a model	Explain in basic terms what statistical Inference means.	Introduction R First Steps with R
Week 3	Exploratory Data Analysis and the Data Science Process: Basic tools (plots, graphs and summary statistics) of EDA, Philosophy of EDA, The Data Science Process	Apply basic tools (plots, graphs, summary statistics) to carry out EDA	Getting to know R Basic R Concepts: Variables, Data Types, Vectors, data. frames, lists and matrices
Week 4	Machine Learning Algorithms Used for Data Science: Linear Regression, k-Nearest Neighbors (k-NN), k-means	Apply basic machine learning algorithms for predictive modeling.	Implement Linear Regression, K-NN on different datasets
Week 5	Machine Learning Algorithm and Usage in Applications: Motivating application: Filtering Spam, Why Linear Regression and k-NN are poor choices for Filtering Spam.	Explain why Linear Regression and k-NN are poor choices for Filtering Spam.	Sample code for filtering spam. Apply filtering spam on different datasets.
Week 6	Machine Learning Algorithm and Usage in Applications: Naive Bayes and why it works for Filtering Spam, Comparing Naïve Bayes and k-NN. Data Wrangling:	Explain why Naive Bayes is a better alternative as compare to k-NN.	Sample R code for dealing with Naïve Bayes. Learn and implement APIs and other tools for scrapping the Web
Week 7	Feature Generation and Feature Selection : user (customer) retention, Feature Generation (brainstorming, role of domain expertise, and place for imagination), Feature Selection algorithms, Filters; Wrappers; Decision Trees; Random Forests	Identify common approaches used for Feature Generation. Identify basic Feature Selection	Apply Feature selection on datasets
Week 8	Logistic Regression: Interpretability, Scalability, Estimating Alpha and Beta, Newton Method, Stochastic Gradient Descent	Identify different attributes of logistic regression	Sample R Code
Week 9	Mid Exam Week		
Week 10	Financial Modeling: Exploratory Data Analysis, In-Sample, Out-of-Sample, Preparing data, Log Returns, Volatility, Exponential Down weightage	Understand different financial models and apply on data	Example R Code on Financial Data
Week 11	Extracting Meaning from Data: What is crowdsourcing? The Kaggle Model, Ethical Implications, Filters, Entropy, Decision Tree, Random Forest and Privacy	Understand meaning and purpose of crowdsourcing. Learn different methods used for it.	Learn and implement crowdsourcing

Week 12	Recommendation Systems: Building a User-Facing Data Product, - Algorithmic ingredients of a Recommendation Engine, Dimensionality Reduction, Singular Value Decomposition, Principal Component Analysis	Identify and explain fundamental and algorithmic concepts that constitute a Recommendation Engine	Exercise: build your own recommendation system
Week 13	Mining Social-Network Graphs: Social networks as graphs, Clustering of graphs, Direct discovery of communities in graphs, Partitioning of graphs, Neighborhood properties in graphs	Understand the mining social network graphs and its properties	Continue for implementing recommendation system
Week 14	Data Visualization: Basic principles, ideas and tools for data visualization, Examples of inspiring (industry) projects	Create effective visualization of given data	Create your own visualization of a complex dataset
Week 15	Data Science and Ethical Issues: Discussions on privacy, security, ethics. Data Science and Risk	Understand ethical and privacy issues of data science	
Week 16	A look back at Data Science, Next-generation data scientists	Discuss the future trends in data science	
Week 17	Revision and Project Presentations		
Week 18	Final Exam Week		
Course Code	CSC-488		
Course Title	Big Data Analytics		
Credit Hours	3 hours per week (2+1)		
Degree Program	Bachelor of Computer Science and Information Technology		
Prerequisites	Database Management System		
Textbook	Erl, Thomas, Wajid Khattak, and Paul Buhler. <i>Big Data Fundamentals: Concepts, Drivers & Techniques</i> , Prentice Hall Press, 2016.		
Reference Material	<ul style="list-style-type: none"> • Marr, Bernard, Big Data: Using SMART big data, analytics and metrics to make better decisions and improve performance, John Wiley & Sons, 2015. • V. Reynolds, Big Data For Beginners: Understanding SMART Big Data, Data Mining & Data Analytics For improved Business Performance, Life Decisions & More!, Kindle Edition, 2016. 		
Course Aims	Introduction to the Big Data, current challenges, trends, and applications. Algorithms for Big Data analysis. Mining and learning algorithms that have been developed specifically to deal with large datasets. Technologies for Big Data Analysis. Big Data technology and tools, special consideration made to the Map-Reduce paradigm and the Hadoop ecosystem.		
Course Objectives	<ul style="list-style-type: none"> • To understand and describe the Big Data Concepts • To apply appropriate techniques of machine learning and tools (models) to analyze Big Data problems • To have a basic understanding of tools such as R, Hadoop, Spark, MapReduce, and data visualization techniques. • To able to utilize and apply the Data Analytics lifecycle to Big Data analytics projects 		
Course Outcomes	At the end of the course, students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/MapReduce) to handle a variety of big data problems, and to be able to apply the analytics techniques on a variety of applications.		
Course Description	This course will cover Introduction to Big-Data, Big data challenges, Business motivation and adaptation of big data, Big Data Planning and Consideration, Foundations for Big Data Systems and Programming, Big Data Analytics Lifecycle, Business Intelligence, Storage Concepts, Real Time Processing of Big Data, Big Data Analysis Techniques, Big data & Machine learning, Semantic Analytics, Visual Analysis and future trends. This course will involve hands-on Python and R programming, Hadoop, Spak and NoSQL on real-world datasets.		

Course Code	CSC-488
Course Title	Big Data Analytics
Credit Hours	3 hours per week (2+1)
Degree Program	Bachelor of Computer Science and Information Technology
Prerequisites	Database Management System
Textbook	Erl, Thomas, Wajid Khattak, and Paul Buhler. <i>Big Data Fundamentals: Concepts, Drivers & Techniques</i> , Prentice Hall Press, 2016.
Reference Material	<ul style="list-style-type: none"> • Marr, Bernard, Big Data: Using SMART big data, analytics and metrics to make better decisions and improve performance, John Wiley & Sons, 2015. • V. Reynolds, Big Data For Beginners: Understanding SMART Big Data, Data Mining & Data Analytics For improved Business Performance, Life Decisions & More!, Kindle Edition, 2016.
Course Aims	Introduction to the Big Data, current challenges, trends, and applications. Algorithms for Big Data analysis. Mining and learning algorithms that have been developed specifically to deal with large datasets. Technologies for Big Data Analysis. Big Data technology and tools, special consideration made to the Map-Reduce paradigm and the Hadoop ecosystem.
Course Objectives	<ul style="list-style-type: none"> • To understand and describe the Big Data Concepts • To apply appropriate techniques of machine learning and tools (models) to analyze Big Data problems • To have a basic understanding of tools such as R, Hadoop, Spark, MapReduce, and data visualization techniques. • To able to utilize and apply the Data Analytics lifecycle to Big Data analytics projects <p>At the end of the course, students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/MapReduce) to handle a variety of big data problems, and to be able to apply the analytics techniques on a variety of applications.</p>
Course Outcomes	This course will cover Introduction to Big-Data, Big data challenges, Business motivation and adaptation of big data, Big Data Planning and Consideration, Foundations for Big Data Systems and Programming, Big Data Analytics Lifecycle, Business Intelligence, Storage Concepts, Real Time Processing of Big Data, Big Data Analysis Techniques, Big data & Machine learning, Semantic Analytics, Visual Analysis and future trends. This course will involve hands-on Python and R programming, Hadoop, Spak and NoSQL on real-world datasets.
Course Description	

Lecture Plan (16 Weeks)

	Topic to be covered	Learning outcomes	Labs
Week 1	Introduction to the course Understanding Big Data: Concepts and Terminologies, Characteristics of Big Data, Types of Data Used for Big Data	Outline of course Ideas of Big data Basic concepts of big data	Introduction to tools used in Big data tasks
Week 2	Big Data Challenges: Difference in Understanding and Utilizing Big Data, Complex and Continuously Evolving Techniques, Data Security, Cloud Based Big Data Solutions	Understanding of key challenges of big data Understanding of evolving technologies may effect big data Understanding emerging trends used for data security and cloud based solution	Introduction to R and R-Studio
Week 3	Business Motivation and Big Data Adoption: Business Dynamics and Architecture, Business Process Management, Internet of Everything (IOE)	Understanding of Business dynamics, different Information and Communication Technologies used for business world	Basic R Concepts: Variables Data Types Vectors

Week 4	Big Data Planning and Consideration: Organizational pre requirements, data procurement, privacy, security, provenance, real time support, performance challenges and requirements.	Understand Planning strategies for Big Data.	Advanced R Concepts: Data frames, Lists, Matrices How to get R help, Reading data in to R
Week 5	Foundations for Big Data Systems and Programming: Getting Started with Hadoop, The Hadoop ecosystem	Learn and Apply the Hadoop Ecosystem	Advanced R Concepts: Visualization Tools
Week 6	Big Data Analytics Lifecycle: Data Identification, Acquisition, Filtering, Extraction, Validation and Cleansing.	Learn Big Data steps as a complete life cycle.	Setting up Hadoop and Exploring Hadoop Distributed File System (HDFS)
Week 7	Big Data Analytics Life Cycle: Data Aggregation and Representation, how to Analyze and Visualize Data. Utilization of Analyzed Results in an Effective Manner	Understanding of BigData Life Cycle with Case Study Example	Setting up and Exploring Spark
Week 8	Business Intelligence: Enterprise Technologies, Data warehousing, Data Mart, Online Transaction Process and Online Analytical Process	Learn different techniques used for enterprise technologies	Study of NoSQL Databases such as Hive/Hbase/ Cassandra/ DynamoDB
Week 9		Mid Exam Week	
Week 10	Storage Concepts: Clusters, Distributed Systems, Sharding and Replication, Case Study	Understand and Apply storage concepts.	Design Data Model using NoSQL Databases such as Hive/Hbase/Cassandra/DynamoDB
Week 11	Real Time Processing of Big Data: Speed Consistency Volume, Event Stream Processing, Complex Event Processing, Real Time Data Processing and MapReduce	Learn Real Time Processing used for Big Data.	Design database schemas and implement using Hive/Hbase/ Cassandra column based databases
Week 12	Big Data Analysis Techniques: Quantitative and Qualitative Analysis, Data Mining, Predictive and Statistical Analysis	Learn Quantitative and Qualitative Analysis and Predictive Analysis	Design database schemas and implement using DynamoDBKeyValue based databases
Week 13	Big data & Machine learning: Next steps in the big data world, Supervised and Unsupervised Learning. Classification, Clustering, Filtering	Learn Techniques of Machine Learning used for Big Data	Explanation of different Machine learning tools used for big data
Week 14	Semantic Analytics: Text Analytics and Natural Language Processing, Sentiment analysis	Understand different analytic techniques	Spark & SparkML
Week 15	Visual Analysis: Heat maps, Time Series Plots, Network Graphs, Spatial Data Mapping	Understand different analytic techniques for visual data	H2O/Azure ML
Week 16	Future Trends in Big Data Analytics	Discuss future trends of Big Data	Project Presentations
Week 17	Revision	Project Presentations	
Week 18	Final Exam Week		

Course Code	CSC-489
Course Title	Ubiquitous Computing
Credit Hours	3+0
Degree Program	Bachelor of Computer Science and Information Technology
Prerequisites	Data Communication and Networking
Textbook	Ubiquitous Computing Fundamentals by John Krumm, Publisher: CDC Press, 2009
Reference Material	<ul style="list-style-type: none"> • Ubiquitous Computing by Eduard ,Publisher: InTech, 2011 • Pervasive Computing and Networking by Mohammad S. Obaidat , Publisher: Wiley, 2011 • Ubiquitous Computing: Smart Devices, Environments and Interaction by Stefan Poslad, Publisher: Wiley, 2008
Course Aims	This course is aimed at providing the students with an ability to learn the Ubiquitous computing integration computation into the environment, rather than having computers as distinct objects. Embedding computation into the environment will enable people to move around and interact with computers more naturally than they currently do. Therefore, the objective of this course is to help students gain a general understanding of ubiquitous computing, ubiquitous computing field of study and interfaces for ubiquitous computing.
Course Objectives	<ul style="list-style-type: none"> • To understand the Basic concepts of Ubiquitous Computing • To learn the Ubiquitous Interactive and Networking Systems • To know the Ubiquitous Computing environment key factors i.e. Location and Context Awareness, Privacy and Interfaces • To learn to collect field data and apply algorithms for processing of sensor data
Course Outcomes	The outcome of the course is to know the Ubiquitous Computing, Interactive Environment, Key Concepts of Ubiquitous Computing like Location and Context Awareness, Privacy and Interfaces. The student must be able to collect field data and apply algorithms for processing of sensor data
Course Description	The course start with the basic concept of Ubiquitous Computing, History of Ubiquitous Computing, Intelligent Environments, and Issues for Ubiquitous Computing. The course includes the discussion on ubiquitous Interactive and Networking Systems. The course is design in such a way that student know all main factors , features and challenges includes in Ubiquitous computing such as privacy, context and Location awareness, field studies and processing of sequential sensor data.

Lecture Plan (16 Weeks)

	Topic to be covered	Learning outcomes
Week 1	Introduction of the Course, Ubiquitous Computing, History of Ubiquitous Computing, Ubiquitous core concepts and Environment, Intelligent Environments, Issues for Ubiquitous Computing	<p>Outline of course</p> <p>Basic concepts of Ubiquitous Computing</p> <ul style="list-style-type: none"> • Augmented Reality • Context-Awareness • Intelligent Environments
Week 2	Ubiquitous Computing Systems: Ubiquitous Systems Challenges, Creating Ubiquitous Systems , Implementing Ubiquitous Systems	<p>Understanding of Ubiquitous Computing Systems</p>
Week 3	Ubiquitous Interactive and Networking Systems: Networked embedded computers i.e. naming, discovery, IPC, UI deployment, access control, Ad-Hoc networking with late bound devices, Ad-Hoc routing, Location and Pose aware i.e. tracking, architecture, privacy, Wearable Devices	<p>Understanding of Ubiquitous Interactive and Networking Systems</p> <ul style="list-style-type: none"> • Interactive Mobile Computers, • Networked Embedded Computers, • Ad-Hoc Networks

Week 4	Privacy in Ubiquitous Computing: Ubiquitous computing Presents New Benefits, What's Hard about Ubiquitous Privacy? Information Collection, Borders of privacy	To get the idea of border of privacy for Ubiquitous Computing
Week 5	Privacy in Ubiquitous Computing: Privacy-driven design, User-controlled privacy, Architecture for user-controlled privacy	What is a user-controlled privacy? To understand the design and Architecture for user-controlled privacy
Week 6	Ubiquitous Computing Field Studies: Introduction, Types of Studies, Study Design Example, Ten Mistakes to Avoid	Understanding and Implementation of different type study design examples
Week 7	Ethnography in Ubiquitous computing: Critique of Ethnographic Research, Evaluating Ethnographic Research Studies, Ethnographic Research in Ubiquitous, Essence of Ethnography in Ubiquitous.	To understand the purpose of ethnography Learning for comparison of Ethnographic research and case study research
Week 8	Interfaces for Ubiquitous Computing: Introduction , From Graphical User Interfaces to Context Data , Inventing the Future, Interaction Design, Classes of User Interface, Input Technologies	Take consideration of various sensors, actuators and design methodologies for designing interface Understanding of various metrics for interfaces and individual system's interface
Week 9	Mid Exam Week	
Week 10	Location of Ubiquitous Computing: Location Tracking, Indoor vs. outdoor, Representing Location Information Aspects of location Proximity, Iteration, Hyperbolic and Angulation, Fingerprinting	To understand Location type, Resolution/Accuracy Infrastructure requirements, Data storage (local or central, System type and Signaling system)
Week 11	Location of Ubiquitous Computing: Physical Position and Symbolic Location, Absolute versus Relative positioning, Localized Location Computation, Accuracy and Precision, Issue about location system	Approaches for determining location, Location Systems, Comparing , Passive location tracking
Week 12	Context-aware computing: What Is Context? Context Categorization, Context Awareness Computing	A complete understanding of context awareness and computing
Week 13	Why Context Awareness Computing? , Need for Context Awareness Computing, Context-Aware Applications, Issues and Challenges	Issues and Challenges in Context Awareness.
Week 14	Processing Sequential Sensor Data: Introduction, Signal terminology and assumptions, Running example: Filtering Mean and median filters.	To understand the different kinds of Filters for processing sensor data
Week 15	Processing Sequential Sensor Data: Kalman filter, Particle filter, Hidden Markov model, Presenting performance results	To learn how to apply different algorithms for processing sequential sensor data
Week 16	Future Trends and Applications in Smart World, Smart Applications of Daily Life	Discussion on state of the art applications developed for smart environments
Week 17	Revision and Project Presentations	
Week 18	Final Exam Week	

Appendage 3008

SUBJECT: Revision of BEE Roadmap for Power Systems Stream

1. Background to the Case

EE – BUKC applied for Change of Scope requesting Pakistan Engineering Council (PEC) to allow increase intake (by 40 students) and to allow Power Systems stream in the BEE program.

PEC team during the Change of Scope (CoS) visit recommended few changes in the existing BEE roadmap of Bahria University to cater the Power Systems Specialization.

The roadmap has been revised:

- 1- No changes in the total Number of Credit Hours
 - 2- No changes in the course offering / semester load in the existing roadmap
 - 3- ‘Power Systems’ stream has been added with additional courses.

EE – departments of Islamabad & Karachi campuses have prepared the attached roadmap along with the course outlines of Power System courses added in the roadmap.

2. Recommendations

Revised BEE Roadmap may be approved.

Roadmap is attached along with course outlines of the Power Systems' stream courses.

3. Financial Effect: Nil

4. Establishment/HR effect if any

Nil

Revised Road Map

Semester-1			
Pre Requisite	Course Code	Course Title	CR
None	GSC110	Calculus and Analytical Geometry	3+0
None	CSC111	Introduction to Computing	1+1
None	ENG104	Functional English	2+0
None	ISL101	Islamic Studies/ Ethics	2+0
		IDEE-1	2+0
None	GSC113	Applied Physics	3+1
None	EEL 112	Workshop Practice	0+1
			Total 13+3
Semester-2			
None	EEL121	Engineering Drawing & CAD	0+1
GSC110 (Calculus and Analytical Geometry)	GSC210	Differential Equations	3+0
CSC111 (Introduction to Computing)	CSC112	Programming Fundamentals	2+1
None	EEN110	Linear Circuit Analysis	3+1
None	CEN120	Digital Logic Design	3+1
None	PAK101	Pakistan Studies	2+0
			Total 13+4

Semester-3			
None	GSC121	Linear Algebra	3+0
EEN110 (Linear Circuit Analysis)	EEN 210	Basic Electronics	3+1
EEN110 (Linear Circuit Analysis)	EEN211	Electrical Network Analysis	3+1
CSC112 (Programming Fundamentals)	CSC210	Object Oriented Programming	3+1
GSC110 (Calculus and Analytical Geometry)	GSC220	Complex Variables and Transforms	3+0
		Total	15+3
Semester-4			
None	HSS120	Communication Skills	3+0
XXXX	EEN225	Breadth Core-I	3+1
GSC220 (Complex Variables and Transforms)	EEN313	Signals and Systems	3+1
EEN 211 (Electrical Network Analysis)	EEN219	Electrical Machines	3+1
GSC110 (Calculus and Analytical Geometry)	GSC 123	Probability Methods in Engineering	3+0
		Total	15+3
Semester-5			
GSC110 (Calculus and Analytical Geometry)	EEN311	Electromagnetic Field Theory	3+0
XXXX	CEN222	Breadth Core-II	3+1
GSC210 (Differential Equations)	GSC320	Numerical Analysis	3+0
EEN313 (Signals and Systems)	EET321	Communication Systems	3+1
XXXX	EEN219	IDE-II	3+1
		Total	15+3
Semester-6			
xxxx	EEN316	Breadth Core-III	3+1
EEN313 (Signals and Systems)	EEN412	Linear Control Systems	3+1
None	HSS423	Entrepreneurship	2+0
XXXX	EEXXXX	Elective 1	3+1
CEN120 (Digital Logic Design)	CEN 321	Microprocessors/ Microcontroller Based Systems	3+1
		Total	14+4
Semester-7			
None	ESC498	Senior Design Project – 1	0+3
None	HSS320	Tech. Writing & Present. Skills	3+0
None	HSSXXXX	Social Sciences Elective	3+0
XXXX	EEXXX	Elective 2	3+1
XXXX	EEXXX	Elective 3	3+1
		Total	12+5
Semester-8			
XXXX	ESC499	Senior Design Project – 2	0+3
None	HSS424	Engineering Ethics	2+0
None	HSS411	Engineering Economics & Management	3+0

XXXX	EEXXXX	Elective 4	3+1
XXXX	EEXXXX	Elective 5	3+1
		Total 11+5	

Total Credit Hours= 138 Credit Hours

IDEE Subjects:

- ESC111 Basic Mechanical Engineering
- GSC104 Surveying and Leveling
- CSC486 Geographical Information System
- ENV440 Energy and Environment
- CSC 221 Data Structure & Algorithm
- CEN 221 Computer Architecture & Organization
- CSC 320 Operating Systems

Breadth Course:

Power (Systems) Engineering	Telecommunication Engineering	Electronics Engineering
EEP 473 Power Distribution and Utilization	CEN222 Computer Communication Networks	EEN 316 Instrumentation and Measurements
EEP 486 Power System Analysis	EEN 225 Electronic Circuit Design	EEN 225 Electronic Circuit Design
EEN 225 Electronic Circuit Design	EEN325 Digital Signal Processing	EEN325 Digital Signal Processing

List of Elective Courses in Electrical Engineering Distributed (Specializations/Streams)

1. Power (Systems) Engineering

- i. Power Distribution and Utilization (**Breadth Core III**)
- ii. Power System Analysis (**Breadth Core II**)
- iii. Electronics Circuit Design (**Breadth Core III**)
- iv. Power System Analysis
- v. Power Generation
- vi. Electrical Power Transmission
- vii. Power Electronics
- viii. Power System Protection
- ix. Power System Stability & Control
- x. Advanced Electrical Machine Design
- xi. High Voltage Engineering
- xii. Renewable Energy Systems
- xiii. Digital Signal Processing
- xiv. Digital Control Systems
- xv. Analog and Digital Communication Systems
- xvi. Integrated Electronic Circuits
- xvii. PLC and Industrial Drives
- xviii. Advanced Electrical Machines
- xix. Introduction to Power Engineering
- xx. Industrial Electronics
- xxi. Instrumentation and Measurements
- xxii. Computer Communication Networks

2. Communication/ Telecommunication Engineering

- i. Computer Communication Networks (**Breadth Core I**)
- ii. Electronic Circuit Design (**Breadth Core II**)
- iii. Digital Signal Processing (**Breadth Core III**)
- iv. Digital Communications
- v. Wave Propagation and Antennas
- vi. Information Theory and Coding
- vii. Instrumentation and Measurements
- viii. Transmission and Switching Systems
- ix. Wireless and Mobile Communications
- x. Satellite Engineering
- xi. Optical Communication
- xii. RF and Microwave Engineering
- xiii. Navigation and Radar Systems
- xiv. Digital Image Processing
- xv. Antenna Theory and Design
- xvi. Mobile and Pervasive Computing
- xvii. Power Distribution and Utilization

3. Electronic Engineering

- i. Instrumentation and Measurements (**Breadth Core I**)
- ii. Electronic Circuit Design (**Breadth Core II**)
- iii. Digital Signal Processing (**Breadth Core III**)
- iv. Power Electronics
- v. Opto-Electronics
- vi. VLSI Design 19
- vii. Industrial Electronics
- viii. Digital Electronics
- ix. Introduction to Nano Technology
- x. Computer Communication Networks
- xi. Wave Propagation and Antenna
- xii. Digital Image Processing
- xiii. Mobile and Wireless Communication
- xiv. Solid State Devices
- xv. Digital Control Systems
- xvi. Power Distribution and Utilization

Note: The student can take up to two courses from the other domains (specialization / stream) with the approval of the department.

Electrical Engineering Course Description Scheme of Studies

Duration	4 years
Number of semesters	8
Number of weeks per semester	18 (16 for teaching and 2 for exams)
Total number of credit hours	138
Non-Engineering courses	15 Courses, 41 Cr Hrs, 30% of total
Engineering courses	28 Courses, 97 Cr Hrs, 70% of total

Courses of Non-Engineering Domain

Knowledge Area	Sub Area	Name of Course	Lec. Cr. Hrs	Lab Cr. Hrs	Total Cr. Hrs.	Total Courses	Total Credits	% Area	% Overall
Humanities	English	Functional English	2	0	2	3	8	19.5	5.9
		Comm. Skills	3	0	3				
		Technical Writing & Present. Skills	3	0	3				
	Culture	Islamic Studies/ Ethics	2	0	2	2	4	9.7	2.9
		Pakistan Studies	2	0	2				
	Social Sciences	Engineering Ethics	2	0	2	2	5	12.2	3.7
		Social Sciences Elective	3	0	3				
		Entrepreneur-ship	2	0	2				
Management Sciences		Engineering Economics & Management	3	0	3	2	5	12.2	3.7
Natural Sciences	Math	Calculus and Analytical Geometry	3	0	3	3	9	22.0	6.6
		Linear Algebra	3	0	3				
		Differential Equations	3	0	3				
	Physics	Applied Physics	3	1	4	1	4	9.8	2.9
	Electives	Elective 1*	3	0	3	2	6	14.6	4.3
		Elective 2*	3	0	3				
Total			40	1	41	15	41	100	30%

*Elective 1 and 2: Multivariable Calculus/ Complex Variables and Transforms/ Numerical Analysis/ Discrete Mathematics.

Courses of Engineering Domain

Knowledge Area	Name of Course	Lec. Cr. Hrs.	Lab Cr. Hrs.	Total Cr. Hrs.	Total Courses	Total Cr. Hrs.	% Area	% Overall
Computing	Introduction to Computing	1	1	2	3	9	9.2	6.5
	Programming Fundamentals	2	1	3				
	Object Oriented Programming	3	1	4				
Electrical Engineering Foundation	Linear Circuit Analysis	3	1	4	9	29	30.0	21
	Electrical Network Analysis	3	1	4				
	Workshop Practice	0	1	1				
	Signals and Systems	3	1	4				
	Basic Electronics	3	1	4				
	Digital Logic Design	3	1	4				
	Microprocessors/ Microcontroller Based Systems	3	1	4				
	Probability Methods in Engineering	3	0	3				
Electrical Engineering Core (Breadth)	Engineering Drawing & CAD	0	1	1	7	27	27.8	19.5
	Communication Systems	3	1	4				
	Electromagnetic Field Theory	3	0	3				
	Electrical Machines	3	1	4				
	Linear Control Systems	3	1	4				
	Breadth Course 1	3	1	4				
	Breadth Course 2	3	1	4				
	Breadth Course 3	3	1	4				

Electrical Engineering Core (Depth)	Depth Elective 1	3	1	4	5	20	20.6	14.5
	Depth Elective 2	3	1	4				
	Depth Elective 3	3	1	4				
	Depth Elective 4	3	1	4				
	Depth Elective 5	3	1	4				
IDEE	IDEE-1	2	0	2	2	6	6.2	4.3
	IDEE-2	3	1	4				
Senior Design Project	Senior Design Project 1	0	3	3	2	6	6.2	4.3
	Senior Design Project 2	0	3	3				
Internship (Summer)		0	0	0	0	0	0	0
Total					28	97	100	70%

Breadth Course 1: EEN316 Instrumentation & Measurement

Breadth Course 2: EEN225 Electronic Circuit Design

Breadth Course 3: EEP 381 Electrical Power Transmission

Breadth Course 4: EEP 486 Power System Analysis

Course Outlines

1. Electrical Power Transmission

Prerequisite: Power Distribution and Utilization

Objectives: The course presents basics of electrical power transmission along with electrical and mechanical design impacts on power transmission in detail and HVDC transmission is introduced.

Course Outline: Percent and per-unit quantities, selection of base and change in base of per unit quantities, node equations, one-line diagram, choice of voltage and choice of AC/DC systems, economic comparison of various transmission systems, standard voltages in Pakistan and abroad for transmission and sub-transmission. Introduction to HV, EHV and UHV system. Conductor types; resistance, skin effect, line inductance based and flux considerations. Inductance of single phase and three phase lines, inductance of composite conductor line, inductance of bundled conductors, capacitance of single phase and three-phase lines, effect of earth on capacitance, capacitance of bundled conductors, parallel circuit lines, Ferranti effect. Short, medium and long transmission lines, solution of equations. Traveling waves, surge impedance loading, equivalent circuit, and power flow through the line, voltage regulation and line surges. Line supports, sag and tension calculation, total length of conductor supports at different levels, mechanical degree of safety, effect of wind pressure and ice loading, conductor vibration and use of dampers. Insulator material, types of insulators, voltage distribution over insulator string, string efficiency, methods of improving the string efficiency, testing of insulators, corona effect, corona loss, radio interference due to corona. Underground cables: types, calculation of inductance and capacitance, insulation resistance, insulation breakdown of cables, thermal characteristics of cables, calculation of current rating of the cables, fault locating techniques, cable jointing techniques. Introduction and classification of HVDC transmission.

Recommended Books:

1. Stevenson, "Elements of Power System", Latest Edition.
2. Grainger and Stevenson, "Power System Analysis", Latest Edition.

2. Advanced Electrical Machines

Prerequisites: Electrical Machines

Objectives: Covers detailed and in depth aspects of Electrical Machines.

Course Outline: Transformers: Equivalent Circuit, per unit system of measurement, voltage regulation and efficiency, three phase transformers, types of connections, testing, parallel operation. Synchronous Generators: Equivalent circuit and operations, Characteristics of Salient and Non-Salient poles, model parameters, Single and parallel operation, ratings. Synchronous Motors: Basic Principle, Equivalent Circuit, steady state operation: Torque speed characteristics, power factor correction, starting of synchronous motors, ratings, speed control. Induction Motors: Production of rotating field and torque, Construction, Synchronous speed, Slip and its effect on rotor frequency and voltage. Equivalent circuit. Power and torque. Losses, efficiency and power factor. Torque-speed characteristic. Starting and speed control. Induction generator. Lab Outline: Based on above course contents

Recommended Books:

1. Stephen J. Chapman, "Electric Machinery Fundamentals", McGraw-Hill. (Latest Edition)
2. Hubert, "Electric Machines Theory, Operation, Applications, Adjustment and Control", Latest Ed.

3. Power Generation

Prerequisite: Power Distribution and Utilization

Objectives: The students learn different power plant and modes of energy conversion to generate electrical energy in this course and the concepts of fuel cells are introduced.

Course Outline: Thermal Power Plants: Sources of conventional energy and method of harnessing, special features and cycles used in steam, gas and diesel power plants, combine cycle systems and cogeneration. Location of the above plants and selection of units, prime movers and associated equipment. Hydroelectric Power Plants: The plants and their equipment, layouts, run of the river and accumulation type station, types of hydroelectric turbines and their stations. Nuclear Power Plants: Nuclear reaction, fission and fusion reaction, critical mass chain reaction, moderators, reactor control and cooling, classification of reactors, different types of reactors, radiation damages, shielding of grays neutrons, materials for construction. Thermoelectric Generators: Thermoelectric effect, solid state description of thermoelectric effect, analysis and design of thermoelectric generators, figure of merit, device configuration, solar and radioisotope powered generators, applications. MHD Generators: Gaseous conductors, analysis and design of MHD generator, problems associated with MHD generation, possible configuration. Photovoltaic Generators: Radiation principles, optical effects in semiconductors and PN junction, analysis and design of converter, fabrication of cells, solar cells in space. Fuel Cells: Thermodynamic principles, efficiency of fuel cell factors limiting the performance, design, new development in fuel cells, possibility of future use in electric vehicles. Wind power generation.

Recommended Books:

1. Arche W. Culp, "Principles of Energy Conversion", Latest Edition.
2. M.M. Wakel, "Power Plant Technology", McGraw-Hill, Latest Edition.

4. Power Distribution & Utilization

Prerequisite: Electrical Network Analysis

Objectives: Students are introduced to the basics of power distribution systems and effective utilization of power in heating and illumination applications.

Course Outline: Introduction to distribution system. Urban, suburban and rural distribution systems. Primary, secondary and tertiary voltages. Radial and ring main systems, application of

distribution transformers, estimation of load, load characteristics, substation switch gears and bus bar arrangements, calculation of voltage drop and regulation in distribution feeders. Grounding and earthing, distribution transformer neutral, earthing resistance, earthing practice in L.V. networks. Power Factor: Disadvantages and causes of low power factor, methods for improvement, application of shunt capacitors in distribution network. Batteries & Electrochemical Processes: Main types of batteries and their working, battery charging, electroplating, electrolysis and electro-metallurgical process. Cathodic protection of poles, gas pipes, oil pipes and water structures. Heating and Welding: Electric heating, resistance, induction and dielectric heating, electric furnaces, microwave heating, electric welding, resistance welding and its types. Fundamentals of Illumination Engineering: Laws, units and terms used, requirements for good lighting, illumination schemes for various situations (street lighting, commercial/industrial lighting, stadium/flood/stage/spot lighting etc.), types of lamps, their working and relative merit.

Recommended Books:

1. M. L. Anand, "A Text Book of Electrical Power", Latest Edition.
2. Turan Gonen, "Electrical Power Distribution System", Latest Edition.

5. Power System Stability & Control

Prerequisite: Power Distribution and Utilization

Objectives: Different aspects of power system operation, monitoring and control are covered with an emphasis on SCADA systems.

Course Outline: Steady state and transient stability problems of multi-machine interconnected systems, Swing equation, point-by-point solution of swing equation. Equal area criterion, One machine and two-machine systems, Critical fault clearing time. Effect of fault on stability, Stability study of typical Power systems. Introduction to power system control and its importance, modes of power system operation, major tasks of operation. SCADA system, control centres, controller tuning, communication sub system, remote terminal unit, data logging. Economic dispatch, characteristics of power generation units, economic dispatch problems with and without consideration of losses, incremental fuel cost, penalty factor, economic power interchange. Voltage, power and frequency control. Evaluation of the effect of speed change on droop characteristics.

Recommended Books:

1. Woolen Barg, "Power Generation, Operation and Control", Latest Edition.
2. Trosten Cegral, "Power System Control Technology", Latest Edition.
3. P. Kundur, "Power System Stability and Control", Latest Edition.

6. Power System Analysis

Prerequisite: Electrical Network Analysis, Power Distribution and Utilization

Objectives: This course has been designed to introduce the importance of analyzing various aspects of power system. It covers power flow studies and fault analysis of both symmetrical and unsymmetrical faults in power networks. This forms the basis for power system operation, control and protection.

Course Outline: The Admittance Model and Network Calculations: Branch and Node admittances; Mutually coupled Branches in Y-bus; Equivalent Admittance Network; Modification of Y-bus; Impedance matrix and Y-bus; the method of successive elimination; Node Elimination

(Kron Reduction); Triangular Factorization. The Impedance Model and Network Calculations: The bus, admittance and impedance Matrices; Thevenin's Theorem and Z-bus; Modification of an existing Z-bus; Direct determination of Z-bus; Calculation of Z-bus elements from Y-bus ; Power Invariant Transformations; Mutually coupled branches in Z-bus. Symmetrical Faults: Transients in RL circuits; internal voltages of loaded machines. Under fault conditions; fault calculations using Zbus ; Equivalent circuits; Selection of circuit breakers. 45 Symmetrical Components and Sequence Networks: Synthesis of unsymmetrical phasors; symmetrical components of unsymmetrical phasors; Networks of a symmetrical Transmission line; sequence Networks of the synchronous Machines; Sequence Networks of Y-impedances; sequence networks; positive, negative and zero sequence networks; Unsymmetrical Faults: Unsymmetrical faults on power systems; single line-to-ground faults; line-to-line faults. Double line-to-ground faults; Demonstration problems; open conductor faults.

Recommended Books:

1. B. S. William, "Elements of Power System Analysis", McGraw Hill, Latest Ed.
2. B. M. Weedy, "Electrical Power Systems", Pergamon Press, Latest Ed..
3. Hadi Saadat, "Power System Analysis", Latest Ed.

7. Power System Protection

Prerequisite: Power Distribution and Utilization

Objectives: The course presents different types of relays, relaying schemes, circuit breakers and fuses. Topics like discrimination and coordination are also introduced.

Course Outline: Introduction to protection system, types of faults, effect of faults, fuse as protective device, types of fuses, characteristics of fuses, selection and application of fuses, discrimination and coordination, current transformer and its operation, relay construction, basic relay terminology, electromagnetic relays, thermal relays, static relays and introduction to microprocessor based protective relays, over current protection, distance protection, impedance relay, R-X 47 diagram of impedance relay, operation of impedance relay in different zones, reactance relay, differential protection of transformers, generator protection, bus bar protection, arc voltage, arc interruption, re-striking voltage and recovery voltage, resistance switching, current chopping circuit breaker, classification of circuit breakers, oil circuit breakers, airblast circuit breakers, air break circuit breakers, SFB6B circuit breakers, vacuum circuit breakers, operational mechanism and rating of circuit breakers. **Recommended Books:**

1. S. Rao, "Switchgear and Protection", Khanna Publisher, Latest Edition.
2. Paithankar & Bhide, "Fundamentals of Power System Protection", Prentice Hall, Latest Edition.

8. Advanced Electrical Machine Design

Prerequisite: Electrical Machines

Objectives: Discussion of design and loading of Power Transformers and Induction motors is introduced and electrical equipment installation; commissioning, testing and troubleshooting practices are discussed.

Course Outline:

Part-A Machine Design: Industrial standardization, national and international standards, codes and testing laboratories, manufacturing and operating systems, design considerations for electrical machines, properties and applications of materials for magnetic machine insulation system and its design considerations, thermal time constant, cooling systems of transformers and rotating machines, duty cycles, ratings and temperature-rise, mechanical design considerations, specific loading and output equations of power transformer and induction motor, design of

transformer or induction motor, introduction to computer aided design (CAD) and computer aided manufacturing (CAM).

Part-B Installation, Maintenance and Troubleshooting of Machines: Safety precautions, troubleshooting and emergency repairs. Installation, commissioning, testing, maintenance, and troubleshooting of (i) power transformers and (ii) induction motors. (iii) AC generators.

Part-C Equipment Training (Practical): Measurement of magnetic flux, inductance and reluctance of a part of electrical machines, study of transformer and rotating-machine parts. Understanding operating principles, ratings and application of the following equipment: power supplies, magnetic contactors, thermal overloads, miniature circuit breakers, metallic-clad circuit breakers, earth leakage circuit breaker, clip-on meters, cable fault locators, Megger earth tester, relay testers, motor controllers, tachometers, phase tester (L.V. and H.V.).

The students will have to submit a hand written report consisting of class work, design and laboratory work for evaluation and viva-voce examination. Theory paper will be from Part-A only.

Recommended Books:

1. S. Rao, "Commissioning, Operation and Maintenance of Electrical Equipment", Khanna Publisher, India, Latest Edition.
2. M. G. Say, "Alternating Current Machines", Latest Edition.

9. Course Title: High Voltage Engineering

Pre-Requisites: (Power Distribution& Utilization)

Objectives: The demand for the generation and transmission of large amounts of electric power today, necessitates in transmission at extra-high voltages. At this juncture, a practicing electrical engineer or a student of electrical engineering is expected to possess knowledge of high voltage techniques and should have sufficient background in high voltage engineering. Upon completion of this course, the participant shall be able to understand high voltage basics and its application appreciate the design principles and critical elements of a high voltage system.

Course Outline:

Introduction, Testing voltages, Generation of High Voltages, Measurements of High Voltages, Electrostatic Field and field stress control, Breakdown Mechanism of Gases, Breakdown in Solids and Liquids, Breakdown in Solids and Liquids, Non-destructive testing technique, Over voltages, Testing procedure and insulation coordination, Over voltages, Testing procedure and insulation coordination, Transients in Power Systems

Recommended Book:

1. High Voltage Engineering by C.L Wadwa

Recommended Text(s)/Reference Books:

2. High Voltage Engineering by M S Naidu
3. High Voltage Engineering Fundamentals by E. Kuffel

Appendage 3009**BSE ROADMAP REVISION****1. Background to the Case**

The “Data Science” is emerged as one of the new areas for exploration in software engineering domain. Currently, the Bachelor of Software Engineering roadmap has couple of courses namely “Big Data Analytics – SEN 332”, “Data Mining – CSC-452” and “Data Warehousing. However, there is no such domain present in the roadmap.

2. Financial Effect: *Nil***3. Recommendations**

During FBOS, it is recommended that a new domain “Data Science” may be introduced for catering the current trends. Further, a new course proposed in the BS(CS) roadmap “Introduction to Data Science – CSC-487” along with other above defined electives may be added to the BSE roadmap (See Annex - A) with effect from Fall-2017.

4. Establishment/HR effect if any *Nil***Annex - A**

S. No	Domain Name	Proposed Courses
1	Information Systems	CEN-451 Data Encryption and Security CSC-458 Management Information System SEN-326 Advanced Database Management System SEN-327 Distributed Database Systems SEN-455 Knowledge Based Management System
2	Image Processing and Computer Vision	EEN-313 Signals and Systems CEN-444 Digital Image Processing CSC-464 Computer Vision
3	Multimedia & Gaming Systems	EET-452 Multimedia Communication SEN-328 Game Application Development SEN-329 Digital Animation SEN-493 Multimedia Systems
4	Intelligent Systems	SEN-443 Introduction to Soft Computing CSC-441 Natural Language Processing SEN-330 Agent Based Computing SEN-331 Scientific Computing
5	Data Science	SEN-332 Big Data Analytics CSC-487 Introduction to Data Science CSC-452 Data Mining CSC-454 Data Warehousing

Note: Course description, outline and other specifics of ‘Introduction to Data Science (CSC-454) are part of Appendage 3007.

Appendage 3010**SUBJECT: Revision of Road Maps of BS Geology, BS Geophysics and BS Environmental Sciences.****1. Background to the Case**

After the Academic Audit of the MS Environmental Science program and recommendation, the Department of Earth and Environmental Sciences revised the road map of the all programs (BS and MS Geology/Geophysics/Environmental Sciences) as per HEC guidelines. After discussion regarding the course revision with the permanent faculty, visiting faculty and the industry professionals, it has been decided that some changes must be made in the road maps of BS programs only. In order to stream line the courses with the industry requirements, all the members of DBOS agreed to forward the revised road map of BS programs of the department at par with HEC approved road map to FBOS for subsequent approval from ACM.

FBoS approved the changes.

2. Recommendations

Revised road maps of BS Geology, BS Geophysics, and BS Environmental Sciences are recommended for approval.

The roadmaps are attached. (A separate document highlighting the changes is also attached).

3. Financial Effect: Nil**4. Establishment/HR effect if any Nil****Highlighted Changes in BS Geology, Geophysics and Environmental Sciences****Bachelor of Science in Geology (changes)****Semester-5 (Third Year)**

Existing Road Map	Proposed Road Map	Credit Hours
Environmental Geology	Environmental Geology	3
Paleontology	Paleontology	3
Igneous and Metamorphic Petrology	Igneous and Metamorphic Petrology	3
Marine Geology	Marine Geology	3
Stratigraphy of Pakistan	Stratigraphy of Pakistan	3
Data Structures (Deleted)	Computing with MAT Lab (New course added)	3
Total Credit hours		18

Semester-6 (Third Year)

Existing Road Map	Proposed Road Map	CR
Micropaleontology & Biostratigraphy	Micropaleontology & Biostratigraphy	3

Earthquake Seismology	Earthquake Seismology	3
Well Logging	Wireline Logging (Course title changed)	3
Petroleum Geology	Petroleum Geology	3
Geology of Pakistan	Geology of Pakistan	3
Total CR		18

Semester-8 (Fourth Year)

Existing Road Map	Proposed Road Map	CR
Geochemical Exploration Techniques	Geochemical Exploration Techniques	3
GIS & Computer Image Processing	GIS & Remote Sensing (Course title changed)	3
Seismic Stratigraphy	Seismic Stratigraphy	3
Thesis		6
	Comprehensive viva voce as per HEC Guidelines (New addition)	0
Total CR		15

Bachelor of Science in Geophysics (Changes)**Semester-4 (Second Year)**

Existing Road Map	Proposed Road Map	CR
Sedimentology	Sedimentology	3
Gravity and Magnetic Exploration Techniques	Gravity and Magnetic Exploration Techniques	3
Mathematical Methods of Physics (Deleted)	Electrical and Radioactive Techniques (Comes from 5th semester)	3
Geotectonic	Geotectonic	3
Advance Mathematics	Advance Mathematics	3
Total CR		15

Semester-5 (Third Year)

Existing Road Map	Proposed Road Map	CR
Electrical and Radioactive Techniques (moved to 4th Semester)	Geomagnetism and Paleomagnetism (Comes from 6th semester)	3
Environmental Geology	Environmental Geology	3
Igneous and Metamorphic Petrology	Igneous and Metamorphic Petrology	3
Marine Geology	Marine Geology	3
Stratigraphy of Pakistan	Stratigraphy of Pakistan	3
Data Structures (Deleted)	Computing with MAT Lab (New course added)	3
Total CR		18

Semester-6 (Third Year)

Existing Road Map	Proposed Road Map	CR
Earthquake Seismology	Earthquake Seismology	3
Geology of Pakistan	Geology of Pakistan	3
Geomagnetism and Paleomagnetism (moved to 5th semester)	Seismic Data Acquisition and Planning (New course added)	3
Well Logging	Wireline Logging (Course title changed)	3
Petroleum Geology	Petroleum Geology	3
Total CR		15

Semester-7 (Fourth Year)

Existing Road Map	Proposed Road Map	CR
Seismic Exploration Techniques (Deleted)	Seismic Data Processing (New course added)	3
Petroleum Engineering	Petroleum Engineering	3
Economic Geology	Economic Geology	3
Hydrogeology	Hydrogeology	3
Research Methodology	Research Methodology	3
Total CR		12

Semester-8 (Fourth Year)

Existing Road Map	Proposed Road Map	CR
Seismic Stratigraphy	Seismic Stratigraphy	3
Geophysical Data Processing (Deleted)	Seismic Data Interpretation (New Course added)	3
Thesis	Thesis	6
GIS & Remote Sensing	GIS & Remote Sensing	3
	Comprehensive viva voce as per HEC Guidelines (New addition)	0
Total CR		15

Bachelor of Science in Environmental Sciences (Changes)**Semester-3 (Second Year)**

Existing Road Map	Proposed Road Map	CR
Environmental Geology (Moved to 5th semester)	Environmental Issues (Comes from 4th semester)	3
Environmental Chemistry	Environmental Chemistry	3
Introduction to Media Studies OR International Relations	Introduction to Media Studies OR International Relations	3
Fundamental of Ecology	Fundamental of Ecology	3
Introduction to Oceanography	Introduction to Oceanography	3
Oral Communication	Oral Communication	3
Total CR		18

Semester-4 (Second Year)

Existing Road Map	Proposed Road Map	CR
Social Theory of Environment	Social Theory of Environment	3
Environmental Microbiology	Environmental Microbiology	3
Applied Ecology	Applied Ecology	3
Environmental Issues (Moved to 3rd Semester)	Introduction to Psychology (New Course added) OR Introduction to Anthropology (Comes from 5th semester)	3
Introduction to Climate Change	Introduction to Climate Change	3
Statistics	Statistics	3
Total CR		18

Semester-5 (Third Year)

Existing Road Map	Proposed Road Map	CR
Environmental Monitoring	Environmental Monitoring	3
Environmental Toxicology	Environmental Toxicology	3
Environmental Management System	Environmental Management System	3

Environmental Biotechnology	Environmental Biotechnology	3
Water Resource Management (Deleted)	Environmental Geology (Comes from 3rd semester)	3
Introduction to Anthropology (Moved to 4th semester) OR Introduction to Sociology (Deleted)	Analytical Techniques in Environmental Sciences (Comes from 6th semester)	3
Total CR		18

Semester-6 (Third Year)

Existing Road Map	Proposed Road Map	CR
Environment and Natural Resource Economics	Environment and Natural Resource Economics	3
Analytical Techniques in Environmental Sciences (Moved to 5th semester)	Environmental Engineering (New Course added)	3
Solid Waste Management	Solid Waste Management	3
Environmental Hazards	Environmental Hazards and Management (Contents and title changed)	3
Remote Sensing and GIS for Environment	Remote Sensing and GIS for Environment	3
Total CR		15

Semester-8 (Fourth Year)

Existing Road Map	Proposed Road Map	CR
Occupational Health & Safety	Occupational Health & Safety	3
Environmental Laws and Policies	Environmental Policies and Laws (Only Title & Content changed)	3
Thesis	Thesis	6
Energy & Environment	Energy & Environment	3
	Comprehensive viva voce as per HEC Guidelines (New addition)	0
Total CR		15

Revised Roadmaps of BS Geology, Geophysics and Environmental Sciences

S. No.	Course Code	Title	C. Hrs
BS Geology			
Class: BS (Geo) 1 (A) Morning			
1	PAK-101	Pakistan Studies	2
2	ISL-101	Islamic Studies	2
3	ENG-103	English I	3
4	GEO-105	Physical & General Geology	2+1
5	MAT-105*	Mathematics	0
6	CSC-105	Introduction to Computers	2+1
7	PHY-101	Physics	2+1

*Academic credit of this course is zero but its contact hours, teaching material and tuition fee are equal to a 3 credit hour course.

Class: BS (Geo) 2 (A) Morning

8	ENG-104	English II	3
9	GEO-110	Fundamentals of Geography & Geomorphology	3
10	GEO-115	Introduction to Geophysics	3
11	GEO-120	Field Geology	2+1
12	MAT-115	Calculus & Analytical Geometry	3
13	CHM-105	Chemistry	2+1

Class: BS (Geo) 3 (A) Morning

14	ENG-232	Oral Communication	3
15	GEO-205	Structural Geology	2+1
16	GEO-210	Mineralogy & Crystallography	2+1
17	CSC-205	Programming Fundamentals	2+1
18	MAT-205	Statistics	3

One of the Following

19	HSS-111	Introduction to IR	3
	HSS-115	Introduction to Media Studies	3
	HSS-201	Introduction to Anthropology	3
	HSS-202	Introduction to Sociology	3

Note: Students will be offered only one of the HSS subjects.

Class: BS (Geo) 4 (A) Morning

20	GEO-215	Sedimentology	3
21	GEO-220	Optical Mineralogy	2+1
22	GEO-225	Geochemistry	3
23	GEO-230	Geotectonics	3
24	MAT-210	Advance Mathematics	3

Field Work 1

25	GEO-235	Geology Field Work & Report-I	0+3
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Class: BS (Geo) 5 (A) Morning

26	GEO-305	Environmental Geology	3
27	GEO-310	Paleontology	3
28	GEO-315	Igneous & Metamorphic Petrology	2+1
29	GEO-320	Marine Geology	3
30	GEO-325	Stratigraphy of Pakistan	3
31	GEO-326	Computing with Matlab	2+1

Class: BS (Geo) 6 (A) Morning

32	GEO - 330	Micropaleontology & Biostratigraphy	3
33	GEO - 335	Earthquake Seismology	3
34	GEO - 340	Wireline Logging	3
35	GEO - 345	Petroleum Geology	3
36	GEO - 350	Geology of Pakistan	3

Field Work 2

37	GEO-335	Geology Field Work & Report-II	0+3
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Class: BS (Geo) 7 (A) Morning

38	GEO-405	Petroleum Engineering	3
39	GEO-410	Engineering Geology	2+1
40	GEO-415	Economic Geology	3
41	GEO-420	Hydrogeology	3
42	GEO-425	Research Methodology	2

Class: BS (Geo) 8 (A) Morning

43	GEO-430	Geochemical Exploration Techniques	3
44	GEO-435	GIS & Remote Sensing	2+1
45	GEO-445	Seismic Stratigraphy	3

46	GEO-440	Thesis	6
47	GEO-465	Comprehensive Viva Voce	0

BS Geophysics**Class: BS (Geop) 1 (A) Morning**

1	PAK-101	Pakistan Studies	2
2	ISL-101	Islamic Studies	2
3	ENG-103	English I	3
4	GEO-105	Physical & General Geology	2+1
5	MAT-105*	Mathematics	0
6	CSC-105	Introduction to Computers	2+1
7	PHY-101	Physics	2+1

*Academic credit of this course is zero but its contact hours, teaching material and tuition fee are equal to a 3 credit hour course.

Class: BS (Geop) 2 (A) Morning

8	ENG-104	English II	3
9	GEO-110	Fundamentals of Geography & Geomorphology	3
10	GEO-120	Field Geology	2+1
11	GEO-115	Introduction to Geophysics	3
12	MAT-115	Calculus & Analytical Geometry	3
13	CHM-105	Chemistry	2+1

Class: BS (Geop) 3 (A) Morning

14	ENG-232	Oral Communication	3
15	GEO-205	Structural Geology	2+1
16	GEO-210	Mineralogy & Crystallography	2+1
17	CSC-205	Programming Fundamentals	2+1
18	MAT-205	Statistics	3

One of the Following

19	HSS-111	Introduction to IR	3
	HSS-115	Introduction to Media Studies	3
	HSS-201	Introduction to Anthropology	3
	HSS-202	Introduction to Sociology	3

Note: Students will be offered only one of the HSS subjects.

Class: BS (Geop) 4 (A) Morning

20	GEO-215	Sedimentology	3
21	GEO-240	Gravity & Magnetic Exploration Techniques	3
22	GEO-365	Electric & Radioactive Techniques	3
23	GEO-230	Geotectonics	3
24	MAT-210	Advance Mathematics	3

Field Work 1

25	GEO-250	Geology& Geophysical Field Work & Report-I	0+3
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Class: BS (Geop) 5 (A) Morning

26	GEO-370	Geomagnetism & Paleomagnetism	3
27	GEO-305	Environmental Geology	3
28	GEO-315	Igneous & metamorphic Petrology	2+1
29	GEO-320	Marine Geology	3

30	GEO-325	Stratigraphy of Pakistan	3
31	GEO-326	Computing with Matlab	2+1

Class: BS (Geop) 6 (A) Morning

32	GEO-335	Earthquake Seismology	3
33	GEO-350	Geology of Pakistan	3
34	GEO-367	Seismic Data Acquisition & Planning	3
35	GEO-340	Wireline Logging	3
36	GEO-345	Petroleum Geology	3

Field Work 2

37	GEO-375	Geology & Geophysical Field Work & Report-II	0+3
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Class: BS (Geop) 7 (A) Morning

38	GEO-470	Seismic Data Processing	3
39	GEO-405	Petroleum Engineering	3
40	GEO-415	Economic Geology	3
41	GEO-420	Hydrogeology	3
42	GEO-425	Research Methodology	2

Class: BS (Geop) 8 (A) Morning

43	GEO-475	Seismic Data Interpretation	3
44	GEO-435	GIS & Remote Sensing	2+1
45	GEO-445	Seismic Stratigraphy	3
46	GEO-460	Thesis	6
47	GEO-465	Comprehensive Viva Voce	0

BS Environmental Sciences**Class: BS ES 1 (A) Morning**

1	PAK-101	Pakistan Studies	2
2	ISL-101	Islamic Studies	2
3	ENG-103	English-I	3
4	ENV-105	Introduction to Environmental Sciences	3
5	PHY-101	Physics	2+1
6	CSC-105	Introduction to Computers	2+1
7	BIO-105* OR	Fundamentals of Biology	0
	MAT-105*	Fundamentals of Mathematics	0

*Academic credit of this course is zero but its contact hours, teaching material and tuition fee are equal to a 3 credit hour course.

Class: BS ES 2 (A) Morning

8	ENG-104	English-II	3
9	ENV-110	Environmental Biology	2+1
10	CHM-105	Chemistry	2+1
11	GEO-110	Fundamentals of Geography & Geomorphology	3
12	GEO-105	Physical & General Geology	2+1
13	MAT-115	Calculus & Analytical Geometry	3

Class: BS ES-3 (A) Morning

14	ENG-232	Oral Communication	3
15	ENV-205	Fundamentals of Ecology	3
16	ENV-210	Environmental Chemistry	3
17	ENV - 230	Environmental Issues	3

18	ENV-245	Introduction to Oceanography	3
19	HSS-111 OR	Introduction to IR	3
	HSS-115	Introduction to Media Studies	3

Note: Students will be offered only one of the HSS subjects.

Class: BS ES-4 (A) Morning

20	ENV - 215	Social Theory of Environment	3
21	ENV - 220	Environmental Microbiology	2+1
22	ENV - 225	Applied Ecology	3
23	ENV- 236	Introduction to Climate Change	3
24	MAT- 205	Statistics	3
25	HSS - 107 OR	Introduction to Psychology	3
	HSS - 201	Introduction to Anthropology	3

Note: Students will be offered only one of the HSS subjects.

Field Work 1

26	ENV-240	Environmental Sciences Field Work + Report	0+3
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Class: BS ES- 5 (A) Morning

27	ENV - 305	Environmental Monitoring	2+1
28	ENV - 310	Environmental Toxicology	2+1
29	ENV - 315	Environmental Management System	3
30	ENV - 320	Environmental Biotechnology	2+1
31	ENV - 305	Environmental Geology	3
32	ENV- 335	Analytical Techniques in Environmental Sciences	2+1

Class: BS ES-6 (A) Morning

33	ENV-330	Environmental & Natural Resource Economics	3
34	ENV-325	Environmental Engineering	3
35	ENV-340	Solid Waste Management	3
36	ENV-345	Environmental Hazards & Management	3
37	ENV-350	Remote Sensing & GIS for Environment	2+1

Class: BS ES-7 (A) Morning

38	ENV-405	Pollution Control Technology	2+1
39	ENV-410	Environmental Impact Assessment	2+1
40	ENV-415	Natural Resource Management	3
41	ENV-420	Research Methods in Environmental Sciences	2
42	GEO-420	Hydrogeology	3

Class: BS ES-8 (A) Morning

43	ENV-425	Occupational Health & Safety	3
44	ENV-430	Environmental Policy & Law	3
45	ENV-435	Thesis	6
46	ENV-440	Energy & Environment	3
47	ENV-445	Comprehensive Viva Voce	0

TRANSCRIPT OF PRESENTATION BY HOD EES BUIC

Slide-1

Department of Earth and Environmental Sciences

Agenda Item # 3010

BS Geology, BS Geophysics and BS Environmental Sciences- Changes to Road maps

Slide-2

1. Changes in the Road maps of BS programs of the department have been recommended in DBOS meeting held on 4th July 2017.
2. These changes in the Road maps were later discussed in the FBOS meeting held on 10th August 2017. The FBOS unanimously recommended the modified Road maps for approval in the 30th ACM.
3. The program is being presented in 30th ACM for approval.

Slide-3

Background

Courses in curricula are being revised with the industry requirements. After discussion regarding the course revision with the permanent faculty, visiting faculty and the industry professionals, it has been decided that some changes must be made in the road maps of all the three disciplines of the BS programs as per HEC guidelines. Roadmap changes semester wise (A).docx Road map of BS programs (B).docx

Recommendation

The changes made in the BS programs of the department are submitted in the 30th ACM for approval and implementation from Fall 2017 semester.

Appendage 3011**LIST OF COURSES ELECTIVE COURSES RECOMMENDED FOR LLM**

S.NO	COURSE CODE	COURSE TITLE	CREDIT HOURS	CHANGE
1.	LLM-724	Cyber Space Law: Internet Jurisdiction and Dispute Resolution	3	Addition
2.	LLM-725	Cybercrime: International Cooperation and Digital Investigations	3	Addition
3.	LLM-726	E-Commerce Laws	3	Addition
4.	LLM-727	Media Laws	3	Addition
5.	LLM-728	Global Security & Human Rights Law	3	Addition
6.	LLM-729	International Refugee Law	3	Addition
7.	LLM-730	International Investment Law	3	Addition
8.	LLM-731	Comparative Criminal Justice	3	Addition
9.	LLM-732	International Humanitarian Law	3	Addition
10.	LLM-733	Immigration Law	3	Addition
11.	LLM-734	Law of Treatise	3	Addition
12.	LLM-735	Islamic Law of War and Peace	3	Addition
13.	LLM-736	International Criminal Law	3	Addition
14.	LLM-737	Energy And Climate Change Law	3	Addition

Course Title : Cyber Space Law: Internet Jurisdiction And Dispute Resolution

a. Course Description:

The Course analyses the concept and theories of jurisdiction under International Law (Public International Law), from the perspective of international criminal law, especially in the context of transnational crimes such as cybercrime, from the perspective of regulation (e.g. data protection and trans-border data flows; online gambling; online content regulation) and from the perspective of private international law/conflicts of law (jurisdiction and applicable law in civil and commercial disputes such as contract, torts generally, defamation and privacy infringements, IP infringements). It therefore takes a novel approach by looking both at private law and public law - but this approach is necessary as internet communications are not restricted to private law and private international law.

b. Topics of Study

- a. Jurisdictional Challenge, State Sovereignty and International Law
- b. Jurisdiction of the Criminal Courts
- c. Jurisdiction and Criminal Investigation and Prosecution
- d. Private International Law: Jurisdiction and Enforcement, Applicable Law: UK and EU US Conflicts of Law
- e. Alternate Dispute Resolution including Online Dispute Resolution
- f. Jurisdiction & Free Trade: TFEU Freedom to Provide Services, Country of Origin Regulation and WTO
- g. Online Gambling and Audio-visual Content as an Example of Cross-border Conflicts
- h. Trans-border data flows and jurisdiction.

c. Recommended Books:

- i. Government in Cyberspace – What Jurisdiction?, Michael Cronin & Bernadette Jew
- ii. Law and Borders - Rise of Law in Cyberspace, David R.Johnson and David G.Post

- iii. Governing Cyberspace, David G.Post
- iv. Online Dispute Resolution: Resolving Conflicts in Cyberspace, Ethan Katsh, Janet Rifkin, 2001
- v. Public International Law of Cyberspace, Kittichaisaree, Kriangsak, 2017, Springer International Publishing.
- vi. Transborder Data Flows and Data Privacy Law, Christopher Kuner, 2013
- vii. Privacy and Legal Issues in Cloud Computing, Anne S. Y Cheung, Rolf H Weber, Edward Elgar Publishing, 2015
- viii. Agreements on Jurisdiction and Choice of Law, Adrian Briggs, Oxford University Press, 2008

Course Title: Cybercrime: International Cooperation And Digital Investigations

a. Course Description:

Internet technologies have enabled new ways of committing crimes and have moved "old" crimes such as fraud online- this has created interesting challenges to the investigation, prosecution and enforcement of the criminal law. Internet technologies are borderless and have enabled an increase in transnational crime. This Course will examine the legal procedural issues arising from trans-border online crime: international co-operation, mutual assistance, extradition; the role played by private actors/industry in the enforcement of cybercrime (payment intermediaries; hosting providers (e.g. cloud computing); internet access providers; domain name registries and registrars etc); the relationship between public and private enforcement; the national and international powers of collecting intelligence and evidence (including surveillance); the law of evidence and admissibility; computer, device and network forensics.

b. Course Contents:

1. European Convention on Cybercrime, 2001
2. Understanding of cybercrime
3. Legal issue related to cybercrime
4. Procedural issues regarding Cybercrime
5. Investigation advancement
6. International cooperation mechanism-traditional crimes
7. Cybercrime and digital investigations-challenges

c. Recommended Books:

1. Ernesto U. Savona, Crime and Technology: New Frontiers for Regulation, Law Enforcement and Research, Springer Science & Business Media, 2013
2. Thomas J Holt, Adam M Bossler, Kathryn C Seigfried-Spellar, Cybercrime and Digital Forensics: An Introduction, Routledge, 11-Feb-2015
3. Ian Walden, Computer Crimes and Digital Investigations, Oxford University Press, 2016
4. Mohamed Chawki, Ashraf Darwish, Mohammad Ayoub Khan, Sapna Tyagi, Cybercrime, Digital Forensics and Jurisdiction, Springer, 2015
5. Anthony Reyes, Richard Brittson, Kevin O'Shea, James Steele, Cyber Crime Investigations: Bridging the Gaps Between Security Professionals, Law Enforcement, and Prosecutors, Syngress, 2011
6. Joshua B. Hill, Nancy E. Marion, Introduction to Cybercrime: Computer Crimes, Laws, and Policing in the 21st Century: Computer Crimes, Laws, and Policing in the 21st Century, ABC-CLIO,2016

Course Title: E-Commerce Laws

a. Course Description:

The course will examine the legal implications of forming and performing international sale contracts using electronic records and communications in place of paper. While the formation

of such contracts using electronic means is supported by a maturing legal framework, the law relating to the use of documents used regularly in the performance of such contracts, including transport document such as bills of lading and sea waybills, as well as insurance policies and certificates, is still firmly anchored to the paper world. Thus, eliminating paper is not as simple or straightforward as it might at first seem and this course will address attendant legal issues and implications in depth. The course will also examine in detail common financial arrangements entered into by international traders for the purpose of the buying and selling of goods across borders.

b. Course Contents

- i. An introduction to ecommerce: law, technology, and business
- ii. The scope of ecommerce: jurisdiction via the internet
- iii. Minimum contacts and the networked economy: personal jurisdiction in cyberspace
- iv. Future concerns: a brief look at choice of law on the 'net
- v. Contracts and signatures
- vi. UNCITRAL and eu perspectives on electronic contracts
- vii. Formation of contracts incorporation (clickwrap etc)
- viii. Signatures
- ix. E-money, e-payments, m-payment
- x. Taxation
- xi. Online gambling
- xii. Prominent legal issues in e-commerce

c. Recommended Books:

- i. Murray: *Information Technology Law: The Law and Society* 3ed (OUP, 2016)
- ii. Edwards & Waelde (eds): *Law and the Internet* 3rd ed (Hart, 2009)
- iii. Hörnle: *Cross-Border Internet Dispute Resolution* (CUP, 2009)
- iv. Law of Electronic Commercial Transactions: Contemporary Issues in the EU, US and China (Routledge 2014)
- v. Wang: *Law of Electronic Commercial Transactions: Contemporary Issues in the EU, US and China* (Routledge, 2010)
- vi. E-Commerce Law Around The World: A Concise Handbook: A Concise Handbook, Volume 1 Of E-Commerce Law Trilogy, Stephen Errol Blythe, Xlibris Corporation, 2011

Course Title: Media Law

a. Course description

The focus of this course is to develop an understanding within the students regarding the laws related to Mass Media, and latest technological and communication laws. There are three regulators to govern media, primarily, PEMRA¹ with having limited jurisdiction over the content; secondly, PTA² controlling the access to the content, the then least active the Press Council of Pakistan. The students will be able to understand the role of regulators the complaint and litigation procedures in the field of Mass Media through this course.

b. Course Contents

- i. Freedom of expressions, Speech and Information
- ii. Restrictions of Freedom of Expressions
- iii. Right to Information
- iv. Pakistan Council of Press
- v. Pakistan Electronic Media Regulatory Authority – I
- vi. Trial of Offences
- vii. Complaint Procedures
- viii. Powers of Authority

¹ Pakistan Electronic Media Regulatory Authority

² Pakistan Telecommunication Authority

- ix. Modern Communications and Legal Implications
- x. Media Ethics and Code of Conduct & Censorship
- xi. Implication of Contempt of Court
- xii. Broadcast Regulation
- xiii. Advertisement Regulations
- xiv. Competition enforcement issues in Media
- xv. Protection of Journalists
- xvi. Intellectual Property Issues in Media

c. ***Recommended*** Readings:

Primary Sources

- 1 The Constitution of Pakistan, 1973
- 2 Article 19, International Covenant on Human Rights.
- 3 Article 10, European Convention on Human Rights
- 4 Defamation Ordinance, 2002
- 5 The Prevention of Anti-National Activities Act 1974
- 6 The Cigarettes (Printing of Warning) Ordinance, 1979
- 7 Punjab Transparency and Right to Information Act, 2013
- 8 Right to Information Act, 2013
- 9 The Official Secret Act, 1923
- 10 Press Council of Pakistan Ordinance, 2002
- 11 The Pakistan Electronic Media Regulatory Authority (Councils of Complaints) Rule, 2010
- 12 The Censorship of Films Rules, 1980
- 13 The Indecent Advertisements Prohibition Act, 1963
- 14 Pakistan Penal Code, 1860
- 15 Copyright Ordinance, 1962
- 16 Copyright Rules, 1967
- 17 The International Copyright Order, 1968

Secondary Sources

- 18 EUROPEAN COMMISSION Competition DG Information, communication and multimedia Media and music publishing “Market Definition in the Media Sector - Economic Issues - Report by Europe Economics for the European Commission, DG Competition”
- 19 DIRECTORATE FOR FINANCIAL, FISCAL AND ENTERPRISE AFFAIRS COMMITTEE ON COMPETITION LAW AND POLICY, Regulation and Competition Issues in Broadcasting in the light of Convergence 1998
- 20 Human Rights Council, Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank la Rue, 4 June 2012, A/HRC/20/17.
- 21 Human Rights Committee, General Comment 11: Prohibition of propaganda for war and inciting national, racial or religious hatred (Art. 20), 29 July 1983.
- 22 Human Rights Council, Report of the Special Rapporteur on the promotion and protection of the rights to freedom of opinion and expression, Addendum, Tenth anniversary joint declaration: Ten key challenges to freedom of expression in the next decade, 25 March 2010, A/HRC/14/23/Add.
- 23 Yasmeen Aftab Ali, “A Comparative Analysis of Media and Media Laws in Pakistan”, (Sang-e-Meel, Publications; 2012)
- 24 M. Abdul Basit, “Media Laws of Pakistan”, (Federal Book House, 2011)

Course Title: Global Security & Human Rights Law

a. Course description

This course will examine the evolution of the laws related to the global security before the establishment of the United Nations and after its establishment. It will cover all the contemporary issues related to the ongoing war on terror and its impacts on the fundamental human rights guaranteed in different covenants of international law. These issues will be contextualized as well to enhance the knowledge of LLM scholars on such emerging trends on GWoT.

b. Course Contents

- Introduction to the course
- History of the Global Security
- The concept of Global Security in Pre UN Charter Law
- Post Charter Law and Global Security
- Use of force by the Security Council and its implication on Human Rights
- Global war on terror & its impact on Humanity
- Global war on terror & its impact on Global Security
- Legality of drone attacks and its impact on human rights violation
- Use of Drone as a weapon and right to life
- Right to Life and its connection with the Global Security
- Extra judicial killing as of violation of right to fair trial
- Denial of Right to Fair trial and its Impact on Global Security
- Role of peace keeping forces in maintaining global security
- Syria crisis and its impact on global security
- Iraq war and its impact on global security
- Afghanistan: Taliban and post-Taliban era, global security & Human Rights
- Emergence of ISIS: Its connection with GWoT and violations of HRs
- GWoT and the Role of Pakistan
- Domestic Laws of Pakistan countering terrorism
- Establishment and extension in the military courts: Violation of Human Rights
- Presentations

c. Recommended Text Books

- Post 9/11 and the State of Permanent Legal Emergency: Security & Human Rights in Countering Terrorism by Aniceto Masferrer (Editor) International Law Journal published by Springer, New York- London 2012.
- Humanitarian Intervention and the Responsibility to Protect: Security an Human Rights by Cristina Gabriela Badescu published by Routledge: London & New York 2011

Course Title: International Refugee Law

a. Course Description

This course will examine the international law related to the protection of refugees, migrants and IDPS. This course will provide an overview of the concept and working of the international law of refugees and its connection with other branches of international law, such as the human rights law.

b. Course Contents

- i. The Refugee Issue
- ii. Protection of Refugees: Rights and duties of refugees
- iii. Ending the Refugee Problem: Durable solutions Potential Root Causes of Refuge and State Responsibility
- iv. The difference between Refugees and IDPS/ TDPS
- v. UNHCR and IDPS/ TDPS
- vi. The difference between Refugees and Migrants
- vii. Complementary/Subsidiary Protection
- viii. Islamic concept of *Hijrah*
- ix. Refugee Law and Pakistan: the problem of Afghans in Pakistan

c. Recommended Books

- i. Corinne Lewis UNHCR and International Refugee Law: From Treaties to Innovation Routledge Research in International Law, Routledge, 2012
- ii. James C. Hathaway , Reconceiving International Refugee Law Volume 30 of International Studies in Human Rights Volume 30 of Nijhoff Law Specials

Course Title: International Investment Law

a. Course description

This course will give an introduction to the major themes and issues of international investment law. The focus of study is the rules contained in the network of more than 3000 bilateral and multilateral treaties on investment protection, as well as the growing number of decisions by arbitral tribunals in this field. Students will analyse the substantive principles of investment law, such as most-favoured nation treatment, fair and equitable treatment, and the rules relating to expropriation. They will also study mechanisms for dispute settlement in the context of investment disputes, particularly investor-state arbitration. Throughout the course, students will consider the extent to which international investment law draws an appropriate balance between investment protection on the one hand and the ability of states to regulate on key public policy issues on the other hand. Students will also look at the challenges of developing a coherent regime of investment rules.

Over the course pack we will examine the sources of international legal rules governing the treatment of FDI, including primarily Bilateral Investment Treaties, or BITs, and the investment chapters of Free Trade Agreements, including various issues concerning of the North American Free Trade Agreement (NAFTA), and the NZ – China FTA. We will also spend time studying the ways in which investment disputes are settled, paying particular attention to international arbitration before the World Bank's International Centre for the Settlement of Investment Disputes (ICSID). The CPEC is one of the major foreign direct investments in Pakistan.

b. Course contents

- a. Historical introduction to international investment law
- b. Overview of the Modern Legal Regime
- c. Bilateral Investment Treaties (BITs)
- d. Effectiveness of BITs & the Future
- e. Multilateral Investment Treaties (MITS)

- f. Jurisdiction: To gain an understanding of the key jurisdictional issues that arise in arbitral proceedings, especially in ICSID arbitrations.
- g. Settlement of investment disputes
- h. Procedure: This session will briefly explore some of the key procedural issues that arise in investor state arbitration.
- i. Relative Standards of Protection: Most-favoured nation (MFN)
- j. Substantive standards: Fair and equitable treatment and full protection and security
- k. Standards of treatment in international investment law
- l. National Treatment: In this session we will work through the key elements that a claimant must prove in order to uphold a claim against a host state that it has violated the national treatment obligation.
- m. Absolute Standards of Protection – Minimum Standard of Treatment, Fair & Equitable Treatment
- n. Investment Contracts & Umbrella Clauses: Many investment treaties contain so-called ‘umbrella clauses’ that require each party to observe obligations arising from particular commitments it has entered into with regard to investments.
- o. Defence of Necessity: In certain circumstances, a State may be excused from its obligations under an investment treaty
- p. Pre-establishment Protection and Admission of Investment
- q. Set Asides & ICSID Annulment Procedures: This session seeks to provide an understanding of what options a party has to challenge an arbitral award.
- r. Expropriation: The goal of this class is to explain the fundamentals of the concept of expropriation. We have already covered some of the basics of this concept in the introductory classes
- s. Remedies and damages; Enforcement

c. **BOOKS:**

- Francesco Francioni; *Access to Justice, Denial of Justice and International Investment Law*
- M. Sornarajah, *The International Law on Foreign Investment*. Cambridge.
- Marc Bungenberg, Joern Griebel, Steffen Hindelang *European Yearbook of International Economic Law*. Special Issue: International Investment law and EU Law. Springer
- Books on Reserve Andrew Newcomb & Lluís Paradell, *Law and Practice of Investment Treaties – Standards of Treatment* (Wolters Kluwer, 2009).
- Stephanw. Schill, *The Multilateralization of International Investment Law*. Cambridge university press.
- M. Sornarajah, *The International Law on Foreign Investment* (Cambridge University Press, 3rd edition, 2010),
- Rudolf Dolzer and Christoph Schreuer, *Principles of International Investment Law* (New York: Oxford University Press, 2008).
- R. Dolzer and C. Schreuer, *Principles of International Investment Law* (Oxford University Press, 2nd edn, 2012),
- Peter Muchlinski, Federico Ortino, & Christoph Schreuer, eds., *The Oxford Handbook of International Investment Law* (Oxford: Oxford University Press, 2008).
- Campbell McLachlan, Laurence Shore, & Matthew Weiniger, *International Investment Arbitration* (New York: Oxford University Press, 2007).
- August Reinisch, ed., *Standards of Investment Protection* (New York: Oxford University Press, 2008).
- M. Sornarajah, *The International Law on Foreign Investment 2/e* (Cambridge: Cambridge University Press, 2004)
- Gus Van Harten, *Investment Treaty Arbitration and Public Law* (New York, Oxford University Press, 2007).

Course Title: Comparative Criminal Justice

a. Course description

This course is designed to provide an overview of the criminal justice process and the criminal justice system in general. Concepts of crime, deviance, and justice are discussed and general theories of crime causality are examined. Special emphasis is placed on the components of the criminal justice system: the police, the prosecutorial and defense functions, the judiciary, and the field of corrections.

This course provides an overview of the history of criminal justice system. Agencies and processes involved in law enforcement and courts as well as correctional approaches will be introduced.

b. Recommended Books

- i. A History of Modern American Criminal Justice by Joseph F. Spillane & David B. Wolcott. Publisher: SAGE Publications, Inc. Publication Year: 2013
- ii. Crime And Punishment In Islamic Law, by Rudolph Peters
- iii. Crime and Law in England, 1750–1840, by Peter King
- iv. Crime and Culpability, A Theory of Criminal Law by Larry Alexander
- v. **Crime Victims: An Introduction to Victimology**, by Andrew Karmen
- vi. **The Death Penalty in America: Current Controversies**, by Adam Bedau
- vii. Crime and Punishment: A History of the Criminal Justice System by Mitchel P. Roth
- viii. Ethical Dilemmas and Decisions in Criminal justice by Joycelyn M. Pollock
- ix. **International Handbook of Juvenile Justice**, by Josine Junger-Tas.

Course Title: International Humanitarian Law

a. Course Description

The International Humanitarian Law (IHL) regulates warfare and protects victims of warfare. It attempts to humanize war as humanity is one of the basic principles of IHL. The course on IHL is an important subject that discusses important issues related to warfare and protection of protected groups. The course will start with origin, scope, historical development of IHL. It aims to define difference between *jus in bello* and *jus ad bellum* and the relevant legal regime that regulate both regimes. The course will also differentiate between different types of conflict, status of protected people and objects under IHL. The course will also discuss contemporary challenges of unlawful combatant and modern warfare and weapons. Also, an often-ignored issue of post conflict application of IHL is discussed in this course. The course will discuss all important legal concept of IHL.

b. Course Contents

- i. Brief introduction of International Law
- ii. *Jus ad bellum* and *jus in bello*
- iii. Brief history and main sources of IHL
- iv. Purpose and aim of IHL
- v. Brief introduction of International Law
- vi. *Jus ad bellum* and *jus in bello*
- vii. Brief history and main sources of IHL
- viii. Purpose and aim of IHL
- ix. Is IHL a *lex specialis* or does it supplant IHRL?
- x. What are the sources of IHL and IHRL? Do they have same sources?
- xi. Implementation and Application of both regimes
- xii. What is the qualification of an armed conflict?
- xiii. International Armed Conflict
- xiv. What constitute the start of armed conflict?
- xv. Non-International Armed Conflict

- xvi. War of Self-determination
- xvii. Law and order situation
- xviii. Basic Principles
- xix. Protected People and Objects
- xx. Common Article 3
- xxi. Direct Participation in Hostilities
- xxii. Prisoners of War
- xxiii. Non-International Armed Conflicts and combatant status
- xxiv. Methods and means of warfare (prohibited weapons and tactics)
- xxv. General principles and special treaty regimes on specific weapons
- xxvi. Implementation of IHL And Institutional Mechanisms
- xxvii. Implementation of IHL And Institutional Mechanisms
- xxviii. Grave Breaches of IHL
- xxix. Protection of Internally Displaced People and RefugeesPeace Support Operations
- xxx. Post Conflict Application of IHL
- xxxi. Transitional Justice

c. Recommended Books

- i. A Roberts, R Guelff, Documents on the Laws of War (Oxford University Press, Oxford 2000)
- ii. Jean-Marie Henckaerts, Louise Doswald-Beck, With contributions by Carolin Alvermann, Knut Darmann, Baptiste Rolle, Customary International Humanitarian Law, Cambridge University Press, (2005).
- iii. JM Henckaerts, L Doswald-Beck, Customary International Humanitarian Law (International Committee of the Red Cross, Cambridge University Press, Cambridge 2005)
- iv. D Fleck (ed), The Handbook of International Humanitarian Law 2nd ed. (Oxford University Press, 2008)
- v. G Solis, The Law of Armed Conflict, (Cambridge University Press, Cambridge 2010)
- vi. Marco Sassòli and Antoine A. Bouvier in co-operation with Susan Carr, Lindsey Cameron and Thomas Maurice, How does law protect in war? Cases, documents and teaching materials on contemporary practice in international humanitarian law, ICRC, Geneva, 2nd edition (2006).

Course Title: Immigration Law

a. Course Description

The action of coming to live permanently in a foreign country is known as **immigration** and the act of leaving one's own country to settle permanently in another is known as **emigration**. Every year lot of people immigrates and emigrates to and from various countries of world in other developed and developing countries, therefore, all countries nowadays has enacted and established immigration/emigration laws and offices/enforcement agencies to deal with said laws. However, unfortunately Pakistan has not advanced rules and regulations to deal immigration and emigration issues except very basic rules and regulations regarding naturalization and Citizenship procedure as provided under Citizenship Act 1951 and few other basic laws like Emigration Ordinance 1979 and Passport Act 1974 to penalize those who violate these said very basic rules and regulations

b. Course Contents

- i. Introduction to terms emigrant, immigrant, non-immigrant, asylum, refugees and different recognized international visa categories

c. Recommended Books

- ii. Whether a non-immigrant can become an immigrant citizen and how immigrant can emigrate Pakistan and vice versa
- iii. Acquiring Modes of Citizenship in Pakistan and in other developed countries of world
- iv. Role of National Database and Registration Authority (NADRA) in implementation of immigration Laws in Pakistan
- v. Role of Federal Investigation Agency (FIA) in enforcing immigration laws in Pakistan
Enforcement of Immigration laws in Pakistan through Ministry of Interior and Ministry of Law
- vi. Comparative study of Immigration Laws in Pakistan and in other countries
- vii. Concept of Refugees status and Role of Office of the United Nations High Commissioner for Refugees (*UNHCR*)
- iii. Comprehensive Case Study and the status of document and undocumented
- ix. Afghan refugees in Pakistan since 1989
 - a. Pakistan Citizenship Act, 1951 (Pakistan)
 - b. NADRA Act, 2000 (Pakistan)
 - c. FIA Act, 1974 (Pakistan)
 - d. Passport Act, 1974 (Pakistan)
 - e. Emigration Act, 1979 (Pakistan)
 - f. Rules of Business, 1973
 - g. Nationality, Immigration and Asylum Act, 2002 (UK)
 - h. Immigration and Nationality Act, 1952 (United States of America)
 - i. Citizenship Act, 1977 (Canada)
 - j. Migration Act, 1958 (Australia)
 - k. Schengen Agreement, 1985 (Europe)
- I. Regulations & Reports of Office of the United Nations High Commissioner for Refugees (*UNHCR*)

Course Title: Law of Treatise

a.Course Description

Article 38 of the International Court of Justice mentioned Treaties as one the sources of International law. It lays the foundation of international law and to most extend governs relationship between states. This course will examine the nature and types of treaties, treaty as source of international and national law. The method of concluding treaty and giving consent for treaty. Important issues like treaty reservations; accession to treaties, registration of treaties are discussed. As treaties are important source of international law, it is important to have mechanism to sign and ratify, as well termination and invalidity of treaty; hence, the issue covers all these issues comprehensively. The course will conclude with brief discussion on important concept of Islamic Law of Treaties.

b.Course Contents

- i. What is a treaty?
- ii. Multi-lateral and Bi-lateral treaties
- iii. What is difference between Treaty, Memorandum of Understanding, Exchange of notes, Protocol?
- iv. Treaties and International Relationship.
- v. What is the legal status of MoUs?
- vi. Is MoU an evidence of intention to conclude a treaty?
- vii. What is state practice regarding MoUs?
- viii. Vienna convention on the Law of Treaties 1969
- ix. Other Convention

- x. Customary international law
- xi. Bilateral and multilateral treaties
- xii. Who can conclude Treaties?
- xiii. International Organizations or between. International Organizations, 1986
- xiv. Ratification and Rectification of treaties
- xv. Relationship between Treaties and domestic law
- xvi. Treaty Reservations
- xvii. Treaty Depositary and Registration
- xviii. Interpretation of Treaties
- xix. Invalidity of Treaties
- xx. Termination of Treaties
- xxi. Successive treaties and Succession of Treaties
- xxii. Amendment in Treaties
- xxiii. Territorial application of Treaties
- xxiv. Islamic Law of Treaty

c. Suggested Readings

- i. Anthony Aust, "Modern treaty law and practice" (Cambridge: Cambridge University Press 2007)
- ii. Ulf Linderfalk, "On the Interpretation of Treaties: The Modern International Law as Expressed in the 1969 Vienna Convention on the Law of Treaties" (Netherlands: Springer 2007)
- iii. Jan Klabbers, "Developments in International Law" (vol:22, MartinusNijhoff Publishers 1996)

Course Title: Islamic Law of War and Peace

a. Course Description

This course will examine

b. CONTENTS OF THE COURSE

- Introduction to the course
- Islamic International Law: A general description
- Ideological war and war of weapons
- Friendship with *Ahl-e-Kitab*: Legal or Illegal
- The concept of *Dar-al-Islam* and *Dar-al-Harb*
- The issue of Jurisdiction of the Courts
- The notion of Modern State System: Islamic State or *Dar-al-Islam*
- State as a Juristic Person
- The issue of recognition of international law from the perspective of *Shariah*
- The concept of Sovereignty
- The sources of international law: a perspective from Islamic Law
- Treatise for peaceful settlement of disputes in Islamic Law
- *Ju ad bellum* in International Law and Islamic Law
- Prohibition on the Use of Force, Security Council, Self-defense, Humanitarian Intervention
- *Jihad*: Offensive or Defensive
- *Cause of War* and *Aim of War* in Islamic Law
- Defensive Jihad: Defense of State, the Ummah or the Din
- Assistance of Muslims outside Dar-al-Islam: Offense or Defense

- The Permission of Muslim Ruler and the issue of Jihadi Organizations
- Peace treaties with Non-Muslims
- Jus in Bello: The Islamic Perspective of Conduct of War
- Presentations

a. Suggested readings

- Jihad, Muzahimat aor Baghwat, By Muhammad Mushtaq Ahmad, Shariah Academy Gujranwala
- The Muslim Conduct of State, Dr. Muhammad Hamidullah, Sh. Ashraf Publishers Lahore
- The Islamic Law of Nations, Majid Khadduri, John Hopkins University Press.
- The Hidayah, Imran Ahsan Khan Nyazee, Amal Bristol Press

Course Title: International Criminal Law

a. Course Description:

The aim of the course is to examine issues and important concepts relating to the international criminal justice. The course will cover historical developments of international criminal justice system and in detail evaluate the contributions of international military and criminal tribunals in the growth of international criminal law. However, the main focus of the subject will be on establishment of International Criminal Court (ICC), its structure, its jurisdiction, and its cases. Another important component of this course is the discussion on international crimes including Crime Against Humanity, War Crimes, Genocide, and Aggression. It is important to discuss elements of these crimes and rule of procedure.

b. Course Contents

- i. Fundamentals of international criminal law
- ii. Aim, Objective and Essence of International Criminal Law
- iii. Institutions (Court, Tribunals, Truth and Reconciliation Commission)
- iv. International Military Tribunal at Nuremberg
- v. International Military Tribunal for the Far East (Tokyo Tribunal)
- vi. The International Criminal Tribunal for the Former Yugoslavia
- vii. International Criminal Tribunal for Rwanda
- viii. The Special Court for Sierra Leone
- ix. The Special Tribunal for Lebanon
- x. Sources of International Criminal Law
- xi. Important Concepts
- xii. Jurisdiction
- xiii. International Criminal Court
- xiv. War Crimes
- xv. Genocide
- xvi. Crime Against Humanity
- xvii. Aggression & Terrorism
- xviii. Rule of Evidence and Procedure of ICC
- xix. Defenses (Article 31 of the ICC)
- xx. Immunity and State Responsibility

c. Recommended reading

- i. Robert Cryer, An Introduction to International Criminal Law and Procedure (2010)
- ii. Otto Triffterer (ed.), Commentary on the International Criminal Court (1999).
- iii. Antonio Cassese et al. (eds.), The Rome Statute of the ICC: A Commentary(2002)
- iv. Lee, Roy S. (ed.), The International Criminal Court. The Making of the Rome Statute: Issues – Negotiations – Results (1999).

Course Title: Energy And Climate Change Law

a. Course Description

To provide students with an understanding of the Pakistan's energy sector and the impact of domestic and international legal and policy developments, reflecting world-wide concerns over diminishing natural resources, market fluctuations; ownership; security of energy supply; the environmental hazards of energy production and consumption; and corporate responsibility.

b. Course Contents

- a. Foundations and sources of international climate and energy law.
- b. Legal and regulatory frameworks of the electricity, gas and renewable energy sectors in Pakistan, including the National Electricity and the Natural Gas Legislations
- c. Climate change and energy law concepts and inter linkages
- d. The structure of the existing energy markets in Pakistan and the impact of the new policy, governance and regulatory framework of the Pakistan's Energy Market; and the role of the Energy Regulator in Pakistan
- e. The role of the key stakeholders in the Australian Energy Market and developments in corporate reporting and responsibility
- f. Principles of international climate: Common But Differentiated Responsibility and Respective Capabilities, Sustainable development, Precautionary Principle, Polluter Pays principle, Sovereignty, Jurisdiction
- g. The adverse impact of energy production and consumption on the environment, in particular greenhouse gas emissions, and international imperatives
- h. International legal framework for climate change
- i. International legal framework for energy
- j. Domestic responses to dealing with environmental harm and the energy sector; the development of the emissions trading scheme, carbon capture and renewable energy targets
- k. Ownership and security of energy supply
- l. Implementation, enforcement and non-compliance procedures
- m. Main legal issues related to the international climate change regime (in the UN Framework Convention on Climate Change and the Kyoto Protocol)
- n. Main issues related to the regulation of renewable energy (access to natural resources, energy production, transportation, supply and consumption patterns)
- o. Governance and regulation: Electricity and nuclear power and
- p. Renewable energy and regulatory responses to climate change.
- q. The issues of climate change, energy security, sustainable development and human rights
- r. The relationship between international trade rules and international climate & energy law.
- s. International Climate Change Law
- t. International Law of the Sea
- u. International legal framework for climate change
- v. International legal framework for energy
- w. International Law of the Marine Environment
- x. Climate Change, Justice and Responsibility

c. Recommended Books

- a. Park, Patricia, "International Law on Energy and Environment" Publisher, by Taylor & Francis Group, LLCCRC Press is an imprint of Taylor & Francis Group, an Informa business
- b. IUCN ACADEMY OF ENVIRONMENTAL LAW RESEARCH STUDIES, Compendium of Sustainable Energy Laws, by Richard L. Ottiger is Dean Emeritus and Professor of

Law at Pace Law School in White Plains, New York, & Nicholas Robinson is Gilbert and Sarah Kerlin Distinguished Professor of Environmental Law & Victor Tafur is a staff attorney for the Pace Energy Project.

- c. Sanam S Haghghi, "Energy Security The External Legal Relations of the European Union with Major Oil- and Gas-Supplying Countries, Publisher, Oxford and Portland, Oregon.
- d. *Catherine Redgwell*: International Regulation of Energy Activities, in M. Roggenkamp, C. Redgwell, A. Rønne, I. del Guayo (eds.): Energy Law in Europe: National, EU and International Law and Institutions, Oxford University Press, 2007, (pp.13-144) (131 p).
- e. *J. Bradbrook and R. D. Wahnschafft*: International Law and Global Sustainable Energy Production and Consumption, in Bradbrook, Lyster, Ottinger and Xi (eds.): The Law of Energy for Sustainable Development, IUCN, Cambridge University Press, 2005, Chapter 11, pp.181-201 (20 p).
- f. Teresa Thorp, Climate Justice: A Constitutional Approach to Unify the Lex Specialis Principles of International Climate Law , Utrecht Law Review, 2012, Vol.8(3), p.7
- g. Cameron, Edward; Limon, Marc, Restoring the Climate by Realizing Rights: The Role of the International Human Rights System , Review of European Community and International Environmental Law (RECIEL), Volume 21, Number 3, 1 November 2012 , pp. 204-219(16)
- h. Joost Pauwelyn, The End of Differential Treatment for Developing Countries? Lessons from the Trade and Climate Change Regimes, Review of European, Comparative & International Environmental Law, Special Issue: Assessing Progress in International Environmental Law, Volume 22, Issue 1, pages 29–41, April 2013
- i. *Rene Lefeber and Sebastian Oberthuer*, Key features of the Kyoto protocol's compliance system, Jutta Brunnée (et al.) eds., Promoting Compliance in an Evolving Climate Regime, Cambridge University Press, 2012, pp 77-101 (24 p)
- j. *Edith Brown Weiss*, Strengthening Compliance with Climate Change Commitments, Holger P. Hestermeyer et.al (eds.) in: Coexistence, Cooperation and Solidarity, Liber Amicorum for Rüdiger Wolfrum, Volume I, Martinus Nijhoff, 2012, 693-720 (27 p)
- k. *Jutta Brunnée*, The Global Climate Regime: Wither Common Concern?, Holger P. Hestermeyer et.al (eds.) in: Coexistence, Cooperation and Solidarity, Liber Amicorum for Rüdiger Wolfrum, Volume I, Martinus Nijhoff, 2012, 721-736 (15 p).
- l. *Christina Voigt*: Security in a Warming World: Competences of the UN Security Council for Preventing Dangerous Climate Change, in: C. Bailliet (ed.): Security: A Multidisciplinary Normative Approach, Brill Publishers, Leiden, 2009, pp. 291-312 (21p). (to be Distributed during class)

Appendage 3012

MBA 3.5 Evening at BULC – Shifting to Weekend Format

1. MBA – 3.5 years evening program has been approved for BULC vide ACM Decision at reference 'A' to run in the evenings. However, for the last few semesters the batch for MBA – 3.5 years could not be formed. In order to resolve the issue, outreach was exercised in different organization recently.
2. Discussions with Senior HR Executives of Bank Alfalah Ltd (BAL) and National Bank of Pakistan (NBP) indicates that MBA – 3.5 years would not be feasible for their employees in evenings. They stated that bank employees may not opt to study MBA – 3.5 years in evenings because of their irregular job timings in banks. They are of the opinion that it is more feasible for their employees to pursue such programs on weekends. A total of 17 Employees from the above banks have shown willingness to enroll in MBA – 3.5 years in Fall-2017 semester. However, they can only join this program if it is offered on weekends rather than weekdays.
3. After due deliberation in the DBOS, MBA – 3.5 years program was recommended to be run as weekend program. Under MBA – 3.5 years weekend program, five courses will be offered in each semester. Two of them will be taught on Saturdays and the remaining three courses will be taught on Sundays. Roadmap of MBA – 3.5 years.

Appendage 3013**Introduction of a new program: MBA in Technology Management****Background / Discussion**

World trend is that universities are coming up with more hybrid programs by building upon two or more disciplines so that students can learn more disciplines at a time in meaningful and systematic manner. The trend in international universities will replace the traditional Master's programs with such hybrid programs.

On the market side, there are a large number of engineering graduates and computing graduates aspiring to obtain management education. MBA in Technology Management program is designed for individuals who wish to specialize in technology related businesses. A Technology Management MBA degree enables individuals to step into high level positions in technology companies in both public and private sectors. This is a unique program currently not being offered in any other university in Karachi. The point was also endorsed by the Corporate Advisory Committee in its 5th meeting held at BUKC. The suggested curriculum of the program is attached at Appendix 1. Added advantage of offering this program will be diversification of our very stagnant MBA program adding dynamism to our MBA program.

HR Implications: Few faculty members can be hired on permanent basis or services of the faculty members for our Engineering and Computing departments can be availed on visiting basis.

Financial Implications: Positive as a new program even with minimum strength will be financially viable

Conclusion

The point was discussed in combined meeting of FBOS of all campuses of Bahria University. The input was obtained from all the campuses. There is a consensus that hybrid program like **MBA in Technology Management** may be launched at BUKC first in morning and then evening and weekended program.

Recommendation

Hence, it is recommended that the agenda item may be approved by the worthy house.

**New Programme Proposal
MBA TECHNOLOGY MANAGEMENT**

A. ACADEMIC DETAILS	
1	Faculty/Department: Management Sciences
2	Name of the Programme: MBA Technology Management
3	Mission of the Programme: Our MBA program promotes academic excellence to produce future business leaders and entrepreneurs in Pakistan and beyond by providing industry driven curriculum and co-curricular activities. The programme inculcates spirit of applying their knowledge and capabilities among students through experiential learning to resolve business issues in larger interest of business and society.
4	Objectives of the Programme: The following are the broad objectives of the Program: 1. To provide strong conceptual base in all the facets of Management like Marketing, Finance, Human Resources Management, MIS and Business Policy areas, and develop skills required for application of concepts to real life business situations.

	<p>2. To bridge the knowledge gap in management education with the focused inputs on technology management to meet the challenging requirements of contemporary technology driven organizations.</p> <p>3. To equip the students with analytical frame of mind to comprehend and handle complex issues in relation to Management of Technology, viz., Technology Forecasting, Search, Transfer and Creation of New Technology.</p>
5	<p>Outcomes of the Programme:</p> <ol style="list-style-type: none"> 1. Scan and organize data, abstracting meaning from information and sharing knowledge. 2. Demonstrate numerical and quantitative and qualitative skills including the use of models relevant to TM and business situations more generally. 3. Demonstrate competence in the design and application of research and the use of the skills required for analyzing and communication potentially complex findings and conclusions. 4. Communicate effectively: listen, negotiate, and persuade or influence others; develop oral and written communication skills using a range of media, including the preparation of business reports. 5. Develop personal effectiveness: improve self-awareness and self-management; time management; develop sensitivity to diversity in people and different situations, and the ability to continue learning. 6. Perform effectively within a team environment and be able to recognize and utilize individuals 'contributions in group processes; team selection, delegation, development and management.
6	<p>Rationale for the Programme: There is a large number of engineering graduates and computing graduates aspiring to obtain management education. MBA in Technology Management program is designed for individuals who wish to specialize in technology related businesses. A Technology Management MBA degree enables individuals to step into high level positions in technology companies in both public and private sectors. This is a unique program currently not being offered in any other university in Karachi.</p>
7	<p>Brief Description of the Programme: MBA technology management is a qualification applicable to technology management and technological innovation in a wide variety of contexts and sectors, including: IT/IS; telecommunications; computing; engineering; manufacturing; transport and logistics; retailing etc. You will focus on strategic analysis and intellectual stimulation whilst gaining interdisciplinary skills and independent judgment – exploring the processes that underpin technological innovation and the challenges of technology from a strategic perspective, with your learning firmly rooted in management practice throughout.</p>
8	Duration: 2 Years
9	Venue(s): On Site
10	<p>Programme Scheduling Format:</p> <ul style="list-style-type: none"> • Morning • Tri-Semester
11	Proposed Date of Commencement: Spring 2018
12	Mode of Study/Examination: Semester System
13	<p>Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>)</p> <p><i>3 Visiting Faculty with 18 years of education (minimum) in relevant field will be required</i></p>
14	<p>Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>)</p> <p><i>Not needed</i></p>
15	<p>Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>)</p> <p><i>Not needed</i></p>
16	<p>Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>)</p> <p><i>Not needed</i></p>
17	<p>Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories:</p> <p><i>Not needed</i></p>
18	Minimum Entry Level: Students with 16 years Non Business Education

15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)]
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)]
17	Projected Annual Gross Earning in Subsequent Years (B 17): <i>(show details & working; add 10% towards all expenses in subsequent years.)</i>
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)]

Financial Implications and Feasibility

Expenditures	Calculation is based on considering it as an independent program Proposed Faculty's Remuneration : Rs. 1800/- (per contact hour) Total Faculty Cost : Rs. $66 \times 3 \times 1800 = 356,400$ /- (06 Faculty Members) Expected Advertisement Cost : Rs. 100,000/- Fixed overhead : Rs. 200,000 Gross Expenses : Rs. 656,400/-
Proposed fee and earning	Rate Per Credit Hour : Rs. 4810/- Total Tuition Fee/per student : Rs. $4810 \times 66 = \text{Rs } 317,460$ Admission Fee : Rs. 21,000/- Caution Money : Rs. 9,000/- Misc Charges : Rs. 3,400/- Total Fee : Rs. 350,860 Expected Earning : Rs. $350,860 \times 10 = \text{Rs } 3,508,600$
Net Estimated Earning	(2 years complete course): Rs. $3,508,600 - 656,400 = \text{Rs } 28,52,200$ Net earning /year Rs. 14,26,100 Per Semester Rs. 713,050

Roadmap

Introduction

MBA technology management is a qualification applicable to technology management and technological innovation in a wide variety of contexts and sectors, including: IT/IS; telecommunications; computing; engineering; manufacturing; transport and logistics; retailing etc. You will focus on strategic analysis and intellectual stimulation whilst gaining interdisciplinary skills and independent judgment – exploring the processes that underpin technological innovation and the challenges of technology from a strategic perspective, with your learning firmly rooted in management practice throughout.

Program Objectives

The following are the broad objectives of the Program:

1. To provide strong conceptual base in all the facets of Management like Marketing, Finance, Human Resources Management, MIS and Business Policy areas, and develop skills required for application of concepts to real life business situations.
2. To bridge the knowledge gap in management education with the focused inputs on technology management to meet the challenging requirements of contemporary technology driven organizations.
3. To equip the students with analytical frame of mind to comprehend and handle complex issues in relation to Management of Technology, viz., Technology Forecasting, Search, Transfer and Creation of New Technology.

Learning Outcomes

1. Scan and organize data, abstracting meaning from information and sharing knowledge.

2. Demonstrate numerical and quantitative and qualitative skills including the use of models relevant to TM and business situations more generally.
3. Demonstrate competence in the design and application of research and the use of the skills required for analyzing and communication potentially complex findings and conclusions.
4. Communicate effectively: listen, negotiate, and persuade or influence others; develop oral and written communication skills using a range of media, including the preparation of business reports.
5. Develop personal effectiveness: improve self-awareness and self-management; time management; develop sensitivity to diversity in people and different situations, and the ability to continue learning.

Perform effectively within a team environment and be able to recognize and utilize individuals' contributions in group processes; team selection, delegation, development and management.

ROAD MAP
MBA 2 years 60 Credit Hours
(Students with 16 years Non Business program)

SEMESTER 1

S.No	Course Code	Course Title	Credit Hours
1		Principles of Management	3
2		Economics	3
3		Financial Accounting	3
4		Business Communication	3

SEMESTER 2

S.No	Course Code	Course Title	Credit Hours
1		Human Resource Management for Technology Firms	3
2		Quantitative Techniques for Management	3
3		Research Methods for Management	3
4		Marketing Management for Technology Firms	3

SEMESTER 3

S.No	Course Code	Course Title	Credit Hours
1		Operations Management	3
2		Total Quality Management	3
3		Technology Acquisitions & Diffusion	3
4		Technology Finance	3

SEMESTER 4

S.No	Course Code	Course Title	Credit Hours
1		Technology Assessment and Forecasting	3
2		Research and Development Management	3
3		Technology Projects, Appraisal and Evaluation	3
4		Strategic Management of Technology	3

S.No	Course Code	Course Title	Credit Hours
1		Dissertation-I	2
2		Technology Transfer Management	3
3		Knowledge Management	3

SEMESTER 6

S.No	Course Code	Course Title	Credit Hours
1		Enterprise Resource Planning (ERP)	3
2		Dissertation-II	4

Curriculum
Principles of Management

UNIT I

Management : Science, Theory and Practice - The Evolution of Management Thought and the Patterns of Management Analysis - Management and Society : Social Responsibility and Ethics - Global and Comparative Management - The Basis of Global Management – Functions of Management-The Nature and Purpose of Planning - Objectives - Strategies, Policies and Planning Premises - Decision Making - Global Planning.

UNIT II

The Nature of Organizing - Organizational Structure : Departmentation - Line/Staff Authority and Decentralization - Effective Organizing and Organizational Culture - Global Organizing. Co-ordination functions in Organisation - Human Factors and Motivation - Leadership - Committees and group Decision Making - Communication - Global Leading.

UNIT III

The System and Process of Controlling - Control Techniques and Information Technology - Global Controlling and Global Challenges – Direction Function – Significance.

UNIT IV

Organisational Behaviour : History - evolution, Challenges & opportunities, contributing disciplines, management functions and relevance to Organisation Behaviour. Organizational Behaviour responses to Global and Cultural diversity. Personality - Determinants, structure, behaviour, assessment, psycho-analytical social learning, job-fit, trait theories. Emotions and Emotional Intelligence as a managerial tool. Attitudes - relationship with behaviour, sources, types, consistency, work attitudes, values - importance, sources, types, ethics and types of management ethics. Perception - Process, Selection, Organisation Errors, Managerial implications of perception. Learning - classical, operant and social cognitive approaches. Implications of learning on managerial performance.

UNIT V

Stress - Nature, sources, Effects, influence of personality, managing stress- Conflict - Management, Levels, Sources, bases, conflict resolution strategies, negotiation. Foundations of group behaviour : team decision making. Issues in Managing teams. Organisational change - Managing planned change. Resistance to change - Approaches to managing organisational change - Organisational Development - values - interventions, change management- Organisational culture - Dynamics, role and types of culture and corporate culture.

REFERENCE

1. Koontz & Weirich, Essentials of Management, Tata McGraw Hill Publishing Company, New Delhi.
2. Stoner, Freeman & Gilbert, Management, PHI, 6th Edition.
3. Robbins.S.P., Fundamentals of Management, Pearson, 2003.
4. Robbins.S. Organisational Behaviour, X edn., Prentice-Hall, India.
5. Umasekaran, Organisational Behaviour.
6. VSP Rao, V Hari Krishna – Management: Text and Cases, Excel Books, I Edition, 2004

Economics

UNIT I

Economics - meaning, nature and scope - Economics and business decision making - Role of Managerial Economist - Fundamental concepts of Managerial Economics- Demand Analysis - meaning, determinants and types of demand - Elasticity of demand.

UNIT II

Supply meaning and determinants - production decisions - production functions - Isoquants, Expansion path - Cobb-Douglas function. Cost concepts - cost - output relationship - Economies and diseconomies of scale - cost functions.

UNIT III

Market structure - characteristics - Pricing and output decisions - methods of pricing - differential pricing - Government intervention and pricing.

UNIT IV

Profit - Meaning and nature - Profit policies - Profit planning and forecasting - Cost volume profit analysis - Investment analysis.

UNIT V

National Income - Business cycle - inflation and deflation - balance of payments - Monetary and Fiscal Policies

REFERENCE

1. Joel Dean - Managerial Economics, Prentice Hall/Pearson.
2. Rangarajan - Principles of Macro Economics, Tata McGraw Hill.
3. Athmanand.R., Managerial Economics, Excel, New Delhi, 2002.
4. P.L.Mehta, Managerial Economics, S.Chand and Sons Company Ltd., New Delhi, 2004.
5. Peterson Lewis, Managerial Economics, Prentice Hall of India, New Delhi, 2002.

Financial Accounting

UNIT I

Financial Accounting - Definition - Accounting Principles - Concepts and conventions - Trial Balance – Final Accounts (Problems) - Depreciation Methods-Straight line method, Written down value method.

UNIT II

Financial Statement Analysis - Objectives - Techniques of Financial Statement Analysis: Accounting Ratios: construction of balance sheet using ratios (problems)-Dupont analysis. Fund Flow Statement - Statement of Changes in Working Capital - Preparation of Fund Flow Statement - Cash Flow Statement Analysis- Distinction between Fund Flow and Cash Flow Statement. Problems

UNIT III

Cost Accounting - Meaning - Distinction between Financial Accounting and Cost Accounting - Cost Terminology: Cost, Cost Centre, Cost Unit - Elements of Cost - Cost Sheet - Problems. Budget, Budgeting, and Budgeting Control - Types of Budgets - Preparation of Flexible and fixed Budgets, master budget and Cash Budget - Problems -Zero Base Budgeting.

Marginal Costing - Definition - distinction between marginal costing and absorption costing - Break even point Analysis - Contribution, p/v Ratio, margin of safety - Decision making under marginal costing system-key factor analysis, make or buy decisions, export decision, sales mix decision- Problems

UNIT IV

Objectives and functions of Financial Management - Role of Financial Management in the

organisation - Risk-Return relationship- Time value of money concepts - Indian Financial system - Legal, Regulatory and tax framework. Sources of Long term finance - Features of Capital market development in India - Role of SEBI in Capital Issues.
Capital Budgeting - methods of appraisal - Conflict in criteria for evaluation - Capital Rationing - Problems - Risk analysis in Capital Budgeting.

UNIT V

Cost of Capital - Computation for each source of finance and weighted average cost of capital - EBIT -EPS Analysis - Operating Leverage - Financial Leverage -problems. Capital Structure Theories - Dividend Policies - Types of Divided Policy.

Working Capital Management - Definition and Objectives - Working Capital Policies - Factors affecting Working Capital requirements - Forecasting Working Capital requirements (problems) - Cash Management - Receivables Management and - Inventory Management - Working Capital, Financing - Sources of Working Capital and Implications of various Committee Reports.

REFERENCE

1. Advanced Accountancy - R.L.Gupta and Radhaswamy
2. Management Accounting - Khan and Jain
3. Management Accounting - S.N.Maheswari
4. Prasanna Chandra, "Financial Management – Theory and Practice", Tata McGraw Hill, New Delhi (1994).
5. I.M.Pandey, "Financial Management", Vikas Publishing, New Delhi.

Marketing Management

UNIT I

Marketing Concepts and Tasks, Defining and delivering customer value and satisfaction – Value chain - Delivery network, Marketing environment, Adapting marketing to new liberalised economy - Digitalisation, Customisation, Changing marketing practices, e-business - setting up websites; Marketing Information System, Strategic marketing planning and organization.

UNIT II

Buyer Behaviour, Market Segmentation and Targeting, Positioning and differentiation strategies, Product life cycle strategies, New product development, Product Mix and Product line decisions, Branding and Packaging, Price setting - objectives, factors and methods, Price adapting policies, Initiating and responding to price changes.

UNIT III

Marketing channel system - Functions and flows; Channel design, Channel management - Selection, Training, Motivation and evaluation of channel members; Channel dynamics - VMS, HMS, MMS; Market logistics decisions.

UNIT IV

Integrated marketing communication process and Mix; Advertising, Sales promotion and Public relation decisions. Direct marketing - Growth, Benefits and Channels; Telemarketing; Salesforce objectives, structure, size and compensation.

UNIT V

Identifying and analysing competitors, Designing competitive strategies for leaders, challengers, followers and nichers : Customer Relationship marketing - Customer database, Data warehousing and mining. Attracting and retaining customers, Customerism in India, Controlling of marketing efforts. Global Target market selection, standardization Vs adoption, Product, Pricing, Distribution and Promotional Policy.

REFERENCE

1. Marketing Management - Philip Kotler - Pearson Education/PHI, 2003.
2. Marketing Management - Rajan Saxena - Tata McGraw Hill, 2002.
3. Marketing Management - Ramasamy & Namakumari - Macmillan India, 2002.
4. Case and Simulations in Marketing - Ramphal and Gupta - Golbatia, Delhi.
5. Marketing Management - S.Jayachandran - TMH, 2003.

Human Resource Management for Technology Firms

UNIT I: Human Resource Function

Human Resource Philosophy – Changing environments of HRM – Strategic human resource management – Using HRM to attain competitive advantage – Trends in HRM – Organisation of HR departments – Line and staff functions – Role of HR Managers.

UNIT II: Recruitment & Placement

Job analysis : Methods - IT and computerised skill inventory - Writing job specification – HR and the responsive organisation. Recruitment and selection process : Employment planning and forecasting - Building employee commitment : Promotion from within - Sources, Developing and Using application forms - IT and recruiting on the internet. Employee Testing & selection : Selection process, basic testing concepts, types of test, work samples & simulation, selection techniques, interview, common interviewing mistakes, Designing & conducting the effective interview, small business applications, computer aided interview.

UNIT III: Training & Development

Orientation & Training: Orienting the employees, the training process, need analysis, Training techniques, special purpose training, Training via the internet. Developing Managers: Management Development - The responsive managers - On-the-job and off-the-job Development techniques using HR to build a responsive organisation. Management Developments and CD-Roms - Key factor for success. Performance appraisal: Methods - Problem and solutions - MBO approach - The appraisal interviews - Performance appraisal in practice. Managing careers: Career planning and development - Managing promotions and transfers.

UNIT IV: Compensation & Managing Quality

Establishing Pay plans : Basics of compensation - factors determining pay rate - Current trends in compensation - Job evaluation - pricing managerial and professional jobs - Computerised job evaluation. Pay for performance and Financial incentives : Money and motivation - incentives for operations employees and executives - Organisation wide incentive plans - Practices in Indian organisations. Benefits and services : Statutory benefits - non-statutory (voluntary) benefits - Insurance benefits - retirement benefits and other welfare measures to build employee commitment.

UNIT V: Labour relations and employee security

Industrial relation and collective bargaining : Trade unions - Collective bargaining - future of trade unionism. Discipline administration - grievances handling - managing dismissals and separation. Labour Welfare : Importance & Implications of labour legislations - Employee health – Auditing HR functions, Future of HRM function.

REFERENCE

1. Gary Dessler, "Human Resource Management", Seventh edition, Prentice-Hall of India P.Ltd., Pearson.
2. David A. DeCenzo & Stephen P.Robbins, Personnel/Human Resource Management, Third edition, PHI/Pearson.

3. VSP Rao, Human Resource Management: Text and cases, First edition, Excel Books, New Delhi - 2000.
4. Dr. R.Venkatapathy & Assissi Menacheri, Industrial Relations & Labour Welfare, Adithya Publications, CBE, 2001.
5. Robert L.Gibson and Marianne H.Mitchell, Introduction to Counseling and Guidance, VI edition, PHI, 2005.

Quantitative Techniques for Management

UNIT I

QT – Introduction – Measures of Central Tendency – Mean, Median, Mode.

Mathematical Models – deterministic and probabilistic – simple business examples – OR and optimization models – Linear Programming – formulation – graphical solution –simplex – solution.

UNIT II

Transportation model – Initial Basic Feasible solutions – optimum solution for non – degeneracy and degeneracy model – Trans-shipment Model – Assignment Model – Travelling Salesmen problem.

UNIT III

Network Model – networking – CPM – critical path – Time estimates – critical path – crashing, Resource levelling, Resources planning. Waiting Line Model – Structure of model – M/M/1 for infinite population.

UNIT IV

Probability – definitions – addition and multiplication Rules (only statements) – simple business application problems – probability distribution – expected value concept – theoretical probability distributions – Binomial, Poisson and Normal – Simple problems applied to business.

UNIT V

Inventory Models – Deterministic – EOQ – EOQ with Price Breaks – Probabilistic Inventory Models - Probabilistic EOQ model – Game theory-zero sum games: Arithmetic and Graphical Method.

Simulation – types of simulation – Monte Carlo simulation – simulation problems. Decision Theory – Pay off tables – decision criteria – decision trees.

REFERENCE

1. Statistics for Management – Richard L Levin & Daid S Rubin
2. Statistical Methods – S P Gupta
3. Operations Research – Kanti Swarup, Gupta And Man Mohan
4. Operations Research – Dr. J.K. Sharma Macmillan Indian Ltd.
5. U.K. Srivastava, G.V. Shenoy, S. C. Sharma, “Quantitative Techniques for Managerial Decision”, Second Edition, Prentice Hall of India

Research Methods for Management

UNIT I

Research - meaning - scope and significance - Types of research - Research Process - Characteristics of good research - Scientific method - Problems in research - Identifying research problem – concepts, constructs and theoretical framework.

UNIT II

Hypothesis:- meaning - sources - Types - formulation Research design - Types - case study -

features of good design - measurement - meaning - need Errors in measurement - Tests of sound measurement Techniques of measurement - scaling Techniques - meaning - Types of scales - scale construction techniques.

UNIT III

Sampling design - meaning - concepts - steps in sampling - criteria for good sample design - Types of sample designs - Probability and non-probability samples. Data collection:- Types of data - sources - Tools for data collection methods of data collection - constructing questionnaire - Pilot study - case study - Data processing:- coding - editing - and tabulation of data - Data analysis.

UNIT IV

Test of Significance:- Assumptions about parametric and non-parametric tests. Parametric Test - T test, F Test and Z test - Non Parametric Test - U Test, Kruskal Wallis, sign test. Multivariate analysis-factor, cluster, MDS, Discriminant ananlysis. (NO Problems). SPSS and its applications.

UNIT V

Interpretation - meaning - Techniques of interpretation - Report writing:- Significance - Report writing:- Steps in report writing - Layout of report - Types of reports - Oral presentation - executive summary - mechanics of writing research report - Precautions for writing report - Norms for using Tables, charts and diagrams - Appendix:- norms for using Index and Bibliography.

REFERENCE

1. Rao K.V.Research methods for management and commerce - sterling
2. Zikmund, Business Research Methods
3. Kothari C.R.- Research methodology
4. Donald R.Cooper and Pamela S.Schindler - Business Research Methods - Tata McGraw Hill.
5. Uma Sekaran, Research Methods for Business, Wiley Publications.

BUISNESS COMMUNICATION

Unit 1:

Communication basics – Business Communication – components – Types – formal communication network – Work team communication – variables – goal – conflict resoulation – non – verbal communication – Cross cultural communication – Business meetings – Business Etiquette.

Unit 2:

Understanding Corporate Communication – Employee Communication – Managing Government Relations – Writing for Media and Media Relations

Unit 3:

Corporate Communication in Brand Promotion – Financial Communication – Crises Communication.

Unit 4:

Report writing: Characterizing & business reports – Types and forms & reports – Project proposals – collection of data – tables constitution – charts – writing the report – documenting the sources – proof reading.

Unit 5:

Business Presentation: Written and oral presentation – work – team presentation – Delivering the business presentation visual aids – slides – electronic presentation – hand-outs – delivering the

presentation – career planning – preparing Resume – job applications – preparation for a job interview – employment interviews – follow-up.

References:

1. Scot Ober, Contemporary business communication, fifth edition, biztantra.
2. Lesiler & Flat lay, Basic Business communication. Tata Mc Graw Hill.

OPERATIONS MANAGEMENT

UNIT I : Operations Management – Meaning – Importance – historical contributions – System view of OM - Operation strategy and competitiveness - Functions of OM – types of production systems

UNIT II : Product design and process selection – Evaluation and Selection of appropriate Production and Operations technology. Product Design and process selection.

Types of layout – analysis and selection of layout – Product and / or Process layout, Cellular, Lean and Agile manufacturing systems – Computer Integrated Manufacturing Systems - Assembly line balancing.

UNIT III : Production planning and control – meaning – functions – aggregate planning – master production schedule (MPS) – Material requirement planning (MRP) – BOM – Capacity requirement planning (CRP) – Techniques – problems in MRP and CRP – an introduction to MRP II and ERP – Business Process Re-engineering - Total Productive Maintenance (TPM)

UNIT IV : Materials management – functions – material planning and budgeting – Value Analysis - purchase functions and procedure - inventory control – types of inventory – safety stock – order point – service level – inventory control systems – perpetual – periodic – JIT – KANBAN.

UNIT V : Total Quality Management Concept - Statistical Quality Control for Acceptance Sampling and Process Control – Concepts of O.C.C. Curve – Use of the O.C. Curve – Concept of Type I and Type II error – Quality movement – Quality circles — ISO Quality Certifications and types – Quality assurance – Six Sigma concept.

References :

1. Production and Operations Management – Everest E Adam & Ebert – PHI – publication forth edition.
2. Operations Management (Theory and Problems) – Joseph G Monks – McGraw Hill Intl.
3. Production and Operations Management – S N Chary – TMH Publications
4. Production and Operations Management – Pannerselvam, PHI
5. Lee J. Krajewski and Larry P. Ritzman, “Operations Management: Process and value Chains”, 7th Edition, PHI, 2007
6. Hunawalla and Patil – production and Operations Management, Himalaya.
7. Modern Production and operations management – E.S Buffa.
8. Lee J. Krajewski and Larry P. Ritzman, “ Operations Management: Strategy and Analysis”, Addison Wesley.
9. Chase, Aquilano & Jacobs “Production and Operations Management”, Tata McGraw Hill.

Total Quality Management

UNIT – I

Total quality management – concepts – quality management in retrospect – evaluation of quality approaches – Basic elements of TQM. Accelerating use of TQM – The continuous improvement process – International trend in continuous improvement process – Service quality Vs Product Quality. Total Quality :- Value & Differential advantage

UNIT – II

Pillars of Total quality management – Strategic thinking and planning, the starting point for total quality – Total quality policy and deployment guidelines – Total quality approaches – Leadership for TQM. Attitude & involvement of top management. Organizational implications.

UNIT – III

Total quality models – Enablers for total quality – quality responsibilities – achieving total commitment to quality – Information & customer – Strategic information system – Strategic quality management.

UNIT – IV

Quality education and training quality process, Quality system – Quality measurement system including the tools of TQM – Quality cost – Quality planning – Quality information feedback – Internal customer conflict – customer retention and problems.

UNIT – V

Strategic choice of markets and customers maintaining competitive advantage – Designing process and products for Quality – TQM and ISO 9000 – Auditing for TQM – TQM in services – TQM in education – The leverage of productivity and Quality – Pitfalls in operationalising Total Quality.

REFERENCES:

1. Total quality – Bharat Wakhlu
2. Total quality Management – Sundararaju
3. Five Pillars of TQM – Bill Creech
4. Total quality management – Joseph and Berk
5. TQM Strategies and Techniques – Stephen George
6. TQM in service sector – R.P. Mohanty and R.R. Lakhe

Technology Acquisitions & Diffusion

UNIT-I

Introduction to technology management: Concept and meaning of technology, Evolution and growth of technology, role and significance of management of technology, Impact of technology on society and business, Forms of technology: process technology and product technology.

UNIT-II

Competitive advantages through new technologies: product development – from scientific breakthrough to marketable product – Role of Government in Technology Development. Linkage between technology, development and competition, Managing research and development (R&D), Managing Intellectual Property.

UNIT-III

Technological Forecasting: Exploratory: Intuitive, Extrapolation, Growth Curves, Technology Monitoring, Normative: Relevance Tree, Morphological Analysis, Mission Flow Diagram

UNIT-IV

Technology Assessment: Technology Choice, Technological Leadership and Follower ship, Technology Acquisition. Meaning of Innovation and creativity, innovation management

UNIT-V

Technology strategy: concept, types, key principles, framework for formulating technology strategy, Technology forecasting: techniques and application-. Technology diffusion and absorption: Rate of Diffusion; Innovation Time and Innovation Cost, Speed of Diffusion. Project management in adoption and implementation of new technologies.

Reference Books

1. Strategic Technology Management - Betz. F. - McGraw-Hill.
2. Management of Technology - Tarek Khalli -, McGraw-Hill.
3. Strategic Management of Technological Innovation – Schilling McGraw-Hill, 2nd edition.
4. Managing Technology and Innovation for Competitive Advantage - V K Narayanan - Pearson Education Asia
5. Strategic Management of Technology & Innovation - Burgelman, R.A., M.A. Madique, and S.C. Wheelwright -. Irwin.
6. Handbook Of Technology Management - Gaynor - Mcgraw Hill
7. Managing New Technology Development - Souder, W.C. and C.M. Crawford - McGraw- Hill.
8. Managing Technological Innovation - Twiss, B. -. Pitman.
9. Bringing New technology To Market - Kathleen R Allen - Prentice Hall India
10. Management Of New Technologies For Global Competitiveness — Christian N Madu - Jaico Publishing House

Technology Finance

Unit I: Technology Finance – Meaning – Definition – Scope – Usefulness of Technology Finance in enabling the managers to take effective financial decisions.

Unit II: Accounting aspects specific to R&D organization to under accounting treatment of technology related payments.

Unit III: Costing for R&D activities: Costing of technologies, activity based costing, target costing and life cycle costing.

Unit IV: Financing of technology payments - Venture capital – Hire purchase and leasing – Project financing aspects

Unit V: Financial appraisal of new technology – Technology Obsolescence.

Suggested Readings:

1. Bhalla, V.K. Financial Management and Policy 2nd, New Delhi, Anmol, 1998.
2. S. Shivaramu International Business Environment and Management, 5th ed., New Delhi, Anmol, 2001.
3. Chandra, Prasanna, Projects: Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill, New Delhi, 1998.
4. Naisbitt, John, High Tech High Touch: Broadways Books, New York, 1998.
5. Shtub, A. J.F. Bard and S. Globerson Project Management Prentice Hall, New Jersey, 1994.

Technology Assessment and Forecasting

Unit I: Technology Forecasting – Meaning and Definition – Merits and demerits – Usefulness of technology forecasting in recent times

Unit II: Various qualitative and quantitative technology forecasting methods with their relative merits and demerits. Exploratory Methods of Technology Forecasting

Unit III: Delphi Technique; Cross Impact Matrix; Curve Fitting; Morphological Methods. Trends Extrapolation; Regression Analysis; Econometric Models; Normative Methods of TF;

Unit IV: OR Models and Simulation; Networks Techniques; Relevance Trees; System Dynamics; Qualitative Methods; Futurology; Activities of TIFAC

Unit V: Forecasting Technology for Planning Decisions - Practical Technological Forecasting

Suggested Readings

1. Ayres, Robert U: Technology Forecasting and Long Range Planning.
2. Bowonder, B and Miyake, T., 1990. Technological Forecasting: Methodologies and Case Studies (Report III) TIFAC, New Delhi, 1990.
3. Bright, James R, Schoeman, Milton, E.F., 1973, A Guide to Practical Technological Forecasting, Prentice Hall.
4. Jones, H and Twiss, BC., 1979. Forecasting Technology for Planning Decisions. Mac Milan, London.
5. Makridakis, Spyros G and et. al; Forecasting, Methods and Applications.Wiley, 1983.

Research & Development Management

Unit I: R&D and Economic Development – R &D as a corporate function – R&D Resources – Leadership and R&D Management – R&D Project Management.

Unit II: Survey of Emerging Technologies; Environment Analysis; Project Proposals; R&D Management: Management of knowledge workers, R & D environment; Management of High value Instruments Test Facilities, Workshops etc.

Unit III: Identification of partners/contractors for R&D Projects; R & D Budget; Technology Scanning: Procurement Procedure; Material Management Policy; Discard Policies and Procedure; Contract Management

Unit IV: Vendor Development; Procurement and Utilization of Capital Equipment; Test Equipment; Test Facilities; Sharing of resources with other Institution - Sponsored Resources; Development Tools.

Unit V: Design Methodologies; CAD / CAM / CIM; Design for Manufacturing; Design for Maintenance.

Suggested Readings:

1. Cetron, Marvin J and Goldhar, Joel D (ed.): The Science of Managing Organised Technology. NY. Gordon & Research, Science Pub., 1970.
2. Jain, R K. and Triandis, H C. Management of Research and Development Organisations; Managing the Unmanageable. N.Y., Wiley, 1990.
3. McLeod, Tom: The Management of Research, Development and Design in Industry. England, Gower, 1988.
4. Meredith, Jack R and Mantel, Samuel, J: Project Management a Managerial Approach. N.Y., Wiley, 1985.
5. NTIS: The Management of Government R & D Projects; the effects of the contractual requirement to use specific management techniques. Texas, University, of Texas at Austin, 1972.

STRATEGIC MANAGEMENT OF TECHNOLOGY FIRMS

UNIT 1

Strategic Management, Developing a strategic Vision, Mission Statement, Establishing objectives, the concept of strategic Intent, Crafting a Strategy.

UNIT 2

The external environment - opportunities, threats, Industry Competition, Competitor analysis, the internal environment - Resources, capabilities and core competencies.

UNIT 3

Strategy and Competitive advantage - Generic Strategies, Co-operative strategies, Merger and Acquisition strategies, Vertical integration strategies, Unbundling and Outsourcing strategies, using offensive and defensive strategies.

UNIT 4

Technology and strategy - Integrating technology and strategy, technology and value chain, technological evolution and forecasting, technological competence, substance and enactment of technology strategy, evolution forces shaping tech-strategy, Technological competencies & capabilities, Core competencies, Technology evolution.

UNIT 5

Tailoring strategy to fit specific industry and company situations - Strategies for competing in Emerging industries, Turbulent and high velocity markets, Maturing Industries, Stagnant industries, and Fragmented industries. Strategies for Industry leaders, Runner - up firms, weak and crisis ridden Business.

References:

1. R.A.Burgelman, M.A.Maidique and S C Wheel Wright: "Strategic Management of Technology and Innovation", McGraw Hill Edn.2001.
2. Thompson and Strickland: "Strategic Management - Concepts and Cases", McGraw Hill Edition 12th Edition, 2001.
3. Betz: "Strategic Technology Management", McGraw Hill.
4. Pankaj Ghemavat: "Strategy and the Business Land Scape", Pearson Education, 1998.
5. M.A.Hitt, R D Ireland and R E Hoskisson: "Strategic Management Competitiveness and Globalization", South -Western Thomson - Learning 2001.
6. Wheelen and Hunger: "Strategic Management and Business Policy", Pearson Edn., 2001.
7. G.Saloner, A Shepaid J.Podolny: "Strategic Management", John Wiley, 2001.

KNOWLEDGE MANAGEMENT

UNIT I

INTRODUCTION

Knowledge management theory and practice, Major approaches to KM cycle, Zack, Bukowitz and Williams, McElroy, Wiig, Integrated cycle.

UNIT II

KNOWLEDGE MANAGEMENT MODELS

Major theoretical KM models, Von Krogh and Ros, Nonaka and Takeuchi, Choo sense-making KM model, Wiig model, Boisot I-space, Complex Adaptive System models, Tacit and Explicit knowledge capture.

UNIT III

KM TOOLS STRATEGY AND METRICS

Knowledge acquisition and creation tools, Sharing and Dissemination tools, KM strategy, Knowledge audit, Gap analysis, KM metrics, Benchmarking, Balanced scorecard, House of Quality method.

UNIT IV

KM IN ORGANISATION

Organisational culture, Organisational maturity models, KM team, Ethics of KM, future challenges for KM, Research issues, Knowledge application at individual, group and organisational levels, Knowledge reuse, Knowledge repositories.

UNIT V

KNOWLEDGE LEADERSHIP

Knowledge Leadership styles, Knowledge alignment with business strategies, Pragmatic knowledge development, Balancing knowledge and business management systems, Constructing knowledge infrastructure.

TEXTBOOK

1. Kimiz Dalkir, Knowledge Management in Theory and Practice, Butterworth –Heinemann 2011

REFERENCES

1. Stuart Barnes, Knowledge Management Systems – Theory and Practice, Cengage Learning, 2002.
2. Steven Cavalieri and Sharon Seivert with Lee W. Lee, Knowledge Leadership – The Art and Science of Knowledge based organisation, Butterworth – Heinemann, 2008
3. Shelda Debowski, Knowledge Management, Wiley India, 2007

ENTERPRISE RESOURCE PLANNING (ERP)

UNIT I

INTRODUCTION

Overview of enterprise systems – Evolution - Risks and benefits - Fundamental technology – Issues to be consider in planning design and implementation of cross functional integrated ERP systems.

UNIT II

ERP SOLUTIONS AND FUNCTIONAL MODULES

Overview of ERP software solutions- Small, medium and large enterprise vendor solutions, BPR, and best business practices - Business process Management, Functional modules.

UNIT III

ERP IMPLEMENTATION

Planning Evaluation and selection of ERP systems - Implementation life cycle – ERP implementation, Methodology and Frame work- Training – Data Migration. People Organization in implementation- Consultants, Vendors and Employees.

UNIT IV

POST IMPLEMENTATION

Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of ERP Implementation.

UNIT V

EMERGING TRENDS ON ERP

Extended ERP systems and ERP add-ons -CRM, SCM, Business analytics - Future trends in ERP systems-web enabled, Wireless technologies, cloud computing.

TEXTBOOK

1. Alexis Leon, ERP demystified, second Edition Tata McGraw-Hill, 2008.

REFERENCES

1. Sinha P. Magal and Jeffery Word, Essentials of Business Process and Information System, Wiley India, 2012
2. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
3. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
4. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009
5. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2006.
6. Summer, ERP, Pearson Education, 2008

TECHNOLOGY PROJECTS APPRAISAL AND EVALUATION

UNIT-I

a) Concept of Project: Characteristics and importance of Technology Projects - Technology Project development cycle - Types of projects - Risk-return trade off. (b) Identification of investment opportunities: Sources of new project ideas - Preliminary screening of projects. (c) Feasibility Studies and Reports: Broad aspects of appraisal – Market feasibility, Technical feasibility, Operational feasibility, Financial feasibility.

UNIT-II

a) Market Appraisal: Market and demand analysis - Market survey - Demand forecasting - Sales projections. (b) Technical Appraisal: Issues involved in technical feasibility - Production technology - Materials and inputs - Plant capacity - Site selection – Plant layout - Site preparation - Civil works and structures - Details of machines and equipment - Specification and cost determination. (c) Operational Appraisal: Heads of cost - Estimates of cost of production - Break even point - Economics of working - Profitability.

UNIT-III

Financial Appraisal: (a) Cost of project and means of financing - Cost of capital - WACC - Marginal cost of capital. (b) Estimation of cash inflows - Basic principles of estimation - Appraisal techniques - Non DCF and DCF techniques - Debt-service coverage ratio. (c) Risk analysis in capital budgeting, sensitivity analysis.

UNIT-IV

a) Social Cost Benefit Analysis: Rationale of SCBA - Approaches to SCBA in India. (b) Financing Technology Projects: Appraisal procedures and practices of financial institutions - Financial statements required for project financing - Venture capital financing - Forms - Models of venture capital financing - Operational projects.

UNIT-V

a) Project Implementation: Net work techniques - Critical path - Project Crashing - Time and cost over runs. PERT and CPM - Project management - Forms of organisation – Project planning and control.

Suggested Readings:

1. Project Appraisal: A Third World View Point: UNID Publications - 1996.
2. Project Evaluation and Management: M.K.Singh.
3. Projects, Preparation, Appraisal and Implementation: Prasanna Chandra, TMH, New Delhi -1998.
4. Project Financing: H.P.S. Pahwa.
5. Clifford. F. Gray, Erik. W. Larson: Project Management, the Managerial Emphasis, McGraw

Hill - 2000.

Appendage 3014

International and Maritime Laws
Financial Break Down, Scheme of Studies, Courses

1. Introduction

Department of Law was established in 2010. The department of Law at Bahria University is successfully running LL.B 5-years program, LL.M (General) 2-years program, and is also offering short-term diplomas.

LLM in Maritime Laws is going to be one of the core program at BUIC due to enrichment of international trade in the region and establishment of iconic Gwadar Port as one of the central project of China Pakistan Economic Corridors. On the other side International Legal Practices through matters related choice of law and jurisdiction are nowadays have turned as of sheer importance, therefore, BU is establishing a degree program to enable the lawyers in both the fields.

Bahria University will be the first institution in Pakistan to start this program. The Program is aligned with interests and expertise of our mother institution i.e. Pakistan Navy. The Program is an opportunity to fill the void in the field of maritime laws and demand of maritime legal experts that surge from the increase in economic activities in the country.

1. New Programme Proposal**LL.M (Maritime)**

A. ACADEMIC DETAILS	
1	Department: Law
2	Name of the Programme: LL.M (Maritime)
3	<p>Mission of the Programme: LLM in Maritime Laws is going to be one of the core program at BUIC due to enrichment of international trade in the region and establishment of iconic Gwadar Port as one of the central project of China Pakistan Economic Corridors. On the other side International Legal Practices through matters related choice of law and jurisdiction are nowadays have turned as of sheer importance, therefore, BU is establishing a degree program to enable the lawyers in both the fields.</p> <p>Bahria University will be the first institution in Pakistan to start this program. The Program is aligned with interests and expertise of our mother institution i.e. Pakistan Navy. The Program is an opportunity to fill the void in the field of maritime laws and demand of maritime legal experts that surge from the increase in economic activities in the country.</p>
4	<p>Objectives of the Programme:</p> <ul style="list-style-type: none"> • To diversify our LLM Programmes • To be the first institution to impart legal education regarding maritime laws in Pakistan • To groom students to be able to assist law makers in policy making. • To produce research regarding real-time maritime issues that can help our policy makers and our forces. • To equip students with skills to tackle issues related to CPEC. • To use expertise of our mother institution, Pakistan Navy in catering niche market.
5	<p>Outcomes of the Programme:</p> <ul style="list-style-type: none"> • Increase in Research output • To tap new market in Maritime Law • To attract students to a program that is linked with CPEC • To build-on the credibility of Pakistan Navy to create an institute that caters to legal issues regarding maritime • To fill the market gap • To equip students with required skills and knowledge to deal with issues regarding Maritime laws.

6	Rationale for the Programme: The Law Department was established in 2010. According to the feasibility report, duly approved by the BoG, it was agreed that in the first instance the LLB degree programme will be strengthened and after its consolidation, LLM and later PhD programmes will be offered by the Department. In Fall-2016 LLM (General) was offered and the program is in its initial phase and after due deliberation and consultation the department aims to launch LLM in Maritime to tap niche market that is in accordance with the needs of the country. The program will be first of its nature in Pakistan. The Programme will enhance the profile of the university and will help in gaining a leadership position in market.
7	Brief Description of the Programme: LLM Maritime Law Program is a partial research Degree. The degree program will be of total 30 credit hours that will include 24 credit hours course work and 6 credit hour research work. Course work will be taught in first two semesters and students will write their thesis in last two regular semesters. The Program will focus on international law, mercantile law, criminal law, trade laws, and environmental laws reading maritime.
8	Duration: 2 year
9	Venue(s): On Site BUIC
10	Programme Scheduling Format: • Morning Mid Day (2:00-5:00 pm)
11	Proposed Date of Commencement: Spring 2018
12	Mode of Study/Examination: Semester System
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) 3 VFM required with LLM (Maritime). Brief Description Attached
14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) NIL
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) NIL
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) NA
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Subject Books (1 Million)
18	Minimum Entry Level: LLB degree holder with minimum of 55% marks or 3.0 CGPA. (as per HEC requirements)
19	Admission Criteria: As per BU admission Policy
20	Additional/Different Examination Requirement (<i>Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue.</i>) HEC LLM Rules 2006
21	Number of Admissions Expected for First Intake: 10-15 Students
22	Number of Admissions Planned/Expected for Subsequent Intakes: 20-25 Students (As per HEC Policy for LLM)
23	Referred by: (<i>delete which is inapplicable</i>) FBOS: (Item 1413) Competent Authority: (CAC Meeting Dated 25 th July 2017)
24	Complete Plan of Studies, inclusive of complete Roadmap: (<i>Attach as Annex 'A'</i>) Attached
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (<i>Attach as Annex 'B'</i>) Attached
B. FINANCIAL DETAILS	
1	Source of Funding: BU: Fully
2	Degree Duration: <u>Annual or Semester System:</u> Annual Number of Years Semester: 4-Semester
	Total Number of Credit Hours: 30 Credit Hours

3	Expected fee to be charged based on Cost & Benefits Analysis: (<i>show working</i>) Per annum fee: or Fee rate per credit hour: 4,990 Attached
4	Expected Number of students for 1st& 2nd Intakes: 15 & 15
5	Expected Earning from first two Intakes (B5): (<i>Show working</i>) 15x 272,640/= 4.089m 15 x 272,640/= 4.089m =8.178m
6	Expected Earnings for the Next Five Years (B6): (<i>show working</i>) 2 years: 8.178m 3 Years: 25 students *3= 75 (75* 300,000=22,500,000 Total=22.5 m +8.17m= 30.67 million
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (<i>Show working</i>) Approx. Rs. 0.6 m Six subjects taught by visiting faculty or by PFM as extra course load= 2200*48=105,600 105,600*6= 633,600
8	Cost of Additional Laboratory Equipment/Tools (B8): (<i>show working</i>) NA
9	Cost of Additional Classrooms (B9): (<i>Include furniture, technical aids etc</i>) NA
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (<i>show details</i>) New Books=1 Million
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (<i>Show details</i>) NA
12	Miscellaneous Expenses required for Starting the Program (B12): <ul style="list-style-type: none"> - Advertisement: No need for separate Advertisement - Printing & Stationery: - Admin Cost: - Any other - Total None
13	Annual Recurring Expenditures in Subsequent Years (B13): <ul style="list-style-type: none"> - Salaries: 0.63 Million - Rentals: NA - Subscriptions/Memberships: NA - Advertisements: No need for separate Advertisement - Printing & Stationery: NA - Admin Cost: NA - Any other - Total: 0.63 Million
14	Total Cost of the Programme (B14): [Add B(7) to B(12)] 0.63 Million
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] 0.63 Million
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] Two Years Net Earnings: 7.548 Million Note: Yearly Intake:-Not per semester
17	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>) 25 (students) x 300,000 (fee) = 7,500,000 7.5. million
18	Projected Annual Net Earning in Subsequent Years: [<i>Subtract B(13) from B(17)</i>] Rs 6.87 Million

2. Scheme of Studies

- The LL.M. programme shall be based on semester system, having four semesters.
- Corresponding to an M. Phil degree, the LL.M. degree Programme shall be of thirty credit hours (Twenty-four credit hours for the coursework and six credit hours for the thesis / dissertation)

	SUBJECTS	CREDITS
Compulsory Course	4	12
Elective Courses	4	12
Research Thesis	1	6
TOTAL	9	30

Sr. No.	Semester I	Semester II	Semester III& IV
1	Compulsory I	Elective I	Thesis
2	Compulsory II	Elective II	
3	Compulsory III	Elective III	
4	Compulsory IV	Elective IV	
	Credit Hours	12	6
Total Credit Hours		12+12+12=30 Cr. Hrs.	

2.1. List of Compulsory Courses

1. Research Methods
2. Public International Law
3. International Maritime Law
4. Carriage of Goods by Sea

2.2. List of Elective Courses

1. Admiralty and Jurisdiction
2. International Trade Law
3. International Commercial Arbitration
4. Commercial Conflict of Laws
5. Shipping laws
6. Shipping Contracts
7. Marine Insurance
8. Law of the Marine Environment
9. Crimes at Sea

3. Fee Structure

The Semester wise break down of the fee for LL.M programme.

	SEMESTER I	SEMESTER II	SEMESTER III	SEMESTER IV
Credit Hours	12	12	6	6
Rate Per Credit Hours Tuition Fee	4,990	4,990	4,990	4,990
Tuition Fee Per Semester	59,880	59,880	29,940	29,940
Admission Fee (One Time)	23,000	-	-	-
Caution Money (Refundable)	10,000	10,000	10,000	10,000
Degree Fee (One Time) *	-	-	-	10,000
Misc. Charges **	5,000	5,000	5,000	5,000
Total	97,880	74,880	44,940	54,940

The consolidated fee of all four semesters of LL.M programme.

SEMESTER NO.	FEE
Semester I	97,880
Semester II	74,880
Semester III	44,940
Semester IV	54,940
GRAND TOTAL	272,640

4. Course Outline

Research Methods	
Credit Hour	03
Class	LL. M.
Course Type	Compulsory Subject
Course Code	LLM-700
Course Introduction	
<p>This course is intended to support the development of students' skills in legal research by introducing students to the methodologies and methods which can be used to conduct research in international and domestic legal studies, using a variety of different intellectual approaches. It will provide students with a thorough grounding in the nature and practicalities of legal research and writing, including the construction of research proposals, questions and strategies, and will equip students with the necessary capabilities to conduct independent legal research.</p>	
Topics	
<p>1. INTRODUCTION TO RESEARCH</p> <ul style="list-style-type: none"> • Primary sources and secondary sources • Basic Legal Research 	
<p>2. FOUNDATIONS OF SOCIAL RESEARCH</p> <ul style="list-style-type: none"> • Understanding its epistemological roots and methodological Options • Introduction to Different Perspectives and types of research • Dealing with ethical concerns (Plagiarism policies) 	
<p>3. DESIGNING RESEARCH</p> <ul style="list-style-type: none"> • Defining the Research Problem and Objectives • Literature Review (both theoretical and empirical) and gap identification • Developing Research Questions • Research Objectives and Design • Tentative Outlines 	
<p>4. METHODS AND TOOLS</p> <ul style="list-style-type: none"> • Ethnographic Approaches • Fieldwork and Participant Observation • Interview • Focus Group Discussion • Survey and Questionnaire Design • Case Study • Participatory Approaches 	
<p>5. Legal Methods</p> <ul style="list-style-type: none"> • Qualitative Legal Research • Case Study Method of Legal Research 	
<p>6. Legal Methods</p> <ul style="list-style-type: none"> • Comparative Legal Research • Inter-disciplinary Legal Research • Empirical and Quantitative Legal Research 	

7. Legal Writing

- Elements of legal writing.
- Purpose of legal writing- research, chamber, courts etc.
- [This covers a practical exercise in writing legal, resulting in writing a research note on a legal topic. After this, exercises for legal writing will commence]

8. Research Proposal**9. Peer Review****References**

- S Hanson, Legal Method and Reasoning (custom, 2nd edn, Cavendish Publishing Limited, London 2011).
- Watkins, Dawn and Burton, Mandy Research Methods in Law (2013) Oxford: Routledge.
- Chatterjee, Charles Methods of research in law (2000) London: Old Bailey Press.
- Hoffman, Marci & Rumsey International and Foreign Legal Research: A coursebook (2008) Leiden: Mirtinus Nijhoff Publishers.
- Knowles, John & Thomas Philip Effective Legal Research 2 nd Edition (2009) London: Sweet & Maxwell.
- Watt, Robert Concise legal research 4 th Edition (2001) Sydney: Federation Press.
- Cane, P and Kritzer, H.(2010). The Oxford Handbook of Empirical Legal Research. Oxford Handbooks.
- Verma, SK & Wani, Afzal V (eds) (2001). Legal Research and Methodology. New Delhi: Indian Law Institute.
- Hughes, William, and Jonathan Lavery. Critical Thinking: An Introduction to the Basic Skills. 4th ed. Peterborough, ON: Broadview, 2004.

Public International Law	
Class	LLM
Credit Hours	03
Type of Class	Compulsory
Course Code	LLM-740
Course Introduction	
International Law deals with the conduct of states and of international organizations, and with their relations inter se, as well as their relations with persons, whether natural or fictitious. International law is vast field and concerns with areas like space, sea, air, organizations, trade and environment etc. and it is impossible to specialize in all aspects. However, the course of Public International Law is designed to impart to students the basic knowledge about core issues of International law. This course will discuss laws related to territory, seas, state recognition, jurisdiction, immunity and state responsibility, Law of Treaties, International Institutions, and International Criminal Law including the functioning of the ICC.	
Topics	
<p>Introduction</p> <ul style="list-style-type: none"> • Is International law Really a Law? <p>Private and Public International Law</p> <p>Relationship between domestic law and international Law</p> <ul style="list-style-type: none"> • Monism • Dualism <p>Sources of International Law</p> <ul style="list-style-type: none"> • Customs, Treaties, General Principles of law, Precedents, Jurist Writings 	

<p>Subject of international law</p> <ul style="list-style-type: none"> • States, Organizations, Individuals <p>State Recognition</p> <ul style="list-style-type: none"> • De facto and De Jure <p>State Jurisdiction</p> <ul style="list-style-type: none"> • Nationality (Active, Passive), Territorial (Objective and Subjective), Universality Principle <p>State Responsibility</p> <p>Sovereign Immunity</p> <p>Diplomatic & Consular immunity</p> <p>Treaties (Vienna Convention on law of treaties)</p> <p>Use of Force</p> <p>Institutions (United Nations, International Court of Justice, International Criminal Court, European Union and others)</p> <p>Law of Seas (Territorial waters, Contagious Zones, and High Seas)</p>
<p>Recommended Books</p> <ul style="list-style-type: none"> • Shaw, Malcom N. <i>International Law</i>. (Cambridge: University Press, 2007). • Malanczuk, Peter. <i>Akehurst's Modern Introduction to International Law</i>, 7th ed, (London: Routledge, 1997). • Shearer, I.A. <i>Starke's Introduction to International Law</i>, 11th ed. (Oxford: University Press, 1994). • Robert Cryer, Hakan Friman & Elizabeth Wilmshurst: An introduction to international criminal law & procedure (Cambridge: 2010) • Malcolm Evans.ed., International Law, 4th edition. (Oxford university Press: 2014). • Rome Statute of the International Criminal Court, 17 July 1998 • Geneva Convention & Additional Protocols • The United Nations Charter, 1945.

International Maritime Laws	
Credit Hour	03
Class	LL. M
Course Type	Compulsory Subject
Course Code	LML-741
Course Introduction	
International Maritime Laws as one of the subject of "LLM Maritime Laws" is other name of the "International Laws of the Sea" or "Law of the Sea" the term which is most commonly referred in the context of "Public International Law". It includes the controlling authorization of States on the sea, sea borders, violation and other contentious issues, between the States through Sea.	
Topics	
<ol style="list-style-type: none"> 1. The History and Sources of the International Law of the Sea 2. The Deep Seabed and the High Seas 3. Maritime Belt and Territorial Sea 4. The Baselines: The Contiguous Zone and Continental Shelf 5. Navigational Rights and Freedoms, Straits used for International Navigation 6. Archipelagic States, Landlocked and Geographically Disadvantaged States 7. The Exclusive Economic Zone 8. Military Uses of the Oceans 9. Land Locked States 10. Marine Resource Management and Marine Environmental Protection 11. Laws for Marine Scientific Research 12. Enclosed and Semi Enclosed Seas 	

- 13. Protection of Underwater Cultural Heritage
- 14. The Legal Regime for Arctic and Antarctic
- 15. The Law for Fisheries
- 16. International Law on Marine Pollution

Reading Material

Primary Sources:

- First United Nations Conference on the Law of the Sea (UNCLOS I)
- Second United Nations Conference on the Law of the Sea (UNCLOS II)
- Third United Nations Conference on the Law of the Sea (UNCLOS III)
- 1958 Geneva Conventions on the Law of the Sea
- Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation(SUA), 1988, and Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms located on the Continental Shelf (and the 2005 Protocols)`
- International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997 (MARPOL)
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC), 1972 (and the 1996 London Protocol)
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
- Convention on the Int Regulations for Preventing Collisions at Sea (COLREG), 1972
- International Convention on Maritime Search and Rescue (SAR), 1979
- Convention on the Territorial Sea and the Contiguous Zone, 1958
- Convention on the Continental Shelf, 1958
- Convention on the High Seas, 1958
- Convention on Fishing and Conservation of the Living Resources of the High Seas, 1958
- United Nations Convention on the Law of the Sea, 1982 (UNCLOS)
- Post-UNCLOS Developments
- Convention on the Territorial Sea and the Contiguous Zone, 1958

Books:

- 1) Douglas Guilfoyle, "Shipping Interdiction and the Law of the Sea" Series: Cambridge Studies in International and Comparative Law (No. 63)
- 2) Donald R. Rothwell, Tim Stephens, The International Law of the Sea (Hart Publishing)
- 3) The IMLI Manual on International Maritime Law, Vol. I The Law of the Sea (General Editor: David Attard, Edited by: Malgosia Fitzmaurice; Norman A. Martínez Gutiérrez, Ignacio Arroyo)
- 4) Hugo Grotius , The Free Sea Translated by Richard Hakluyt, Edited and with an Introduction by David Armitage)
- 5) Louis Sohn, Kristen Juras and John Noyes, The Law of the Sea in a Nutshell (Nutshells) West Publishers, 2nd Edition
- 6) Edited by Donald R. Rothwell, Alex G. Oude Elferink, Karen N. Scott, and Tim Stephens, "The Oxford Handbook of the Law of the Sea"

Carriage of Goods by Sea	
Credit Hour	03
Class	LL. M
Course Type	Compulsory Subject
Course Code	LLM-742
Course Introduction	
<p>This course will consider the legal regime applicable to the carriage of goods by sea and, in particular, the legal relationship between the shipper (or owner of the goods), the carrier (ship-owners) and the recipient (consignee) of the goods shipped.</p> <p>It will cover International sale of goods, Carriage of goods by sea and contracts, including bills of lading, charter party, implied terms, Hague / Hague Visby Rules, Hamburg Rules, Rotterdam Rules, Liability, exceptions and limitation of liability, and Dispute resolution in carriage of goods by sea.</p>	
Topics	
<ol style="list-style-type: none"> 1. Introduction to international carriage of goods (transportation, freight forwarding, contracts, documents, international trade, cargo insurance.) 2. Introduction to international carriage of goods (international conventions, general framework, research of contracting states) 3. Carriage of goods by sea; contracts of affreightment and international conventions (Hague-Visby Rules 1968, Hamburg Rules 1978 and Rotterdam Rules 2009) 4. Carriage of goods by sea and inland waterways; contracts of affreightment and international conventions (rights and duties in the framework of Hague-Visby, Hamburg and Rotterdam Rules) <ul style="list-style-type: none"> a. Application of Convention on Contracts for International Sale of Goods 1980 b. The United Nations Convention on the Carriage of Goods by Sea 1978 c. The International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading 1924 d. The United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea 2008 5. Carriage of goods by sea; charter parties and charter-party bills of lading 6. Road and rail carriage framework 7. Air carriage and its international framework - Warsaw and Montreal Conventions 8. Multimodal transport - application of transport regimes and difficulties 9. Multimodal transport - Rotterdam Rules and/or other solutions? 10. Conflict 11. of laws in the context of transport 12. Carriage of Goods by Sea Act 1925 (Pakistan) 	
Reading Material	
<ul style="list-style-type: none"> • John J Wilson, Carriage of Goods by Sea (7th ed, 2010), England: Person/Longman • Stephen Girvin, Carriage of Goods by Sea (2007), Oxford: Oxford Univ Press • A D Hughes, Casebook on Carriage of Goods by Sea (2nd ed, 1999), London: Blackstone • Carriage of Goods by Sea Act 1925 • UN Convention on Contracts for International Sale of Goods 1980 • The United Nations Convention on the Carriage of Goods by Sea 1978 • The International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading 1924 • The United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea 2008 	

International Commercial Arbitration	
Credit Hour	03
Class	LL. M
Course Type	Elective Subject
Course Code	LLM-743
Course Introduction	
<p>International commercial arbitration has become the primary form of dispute resolution in international trade settings. This course will offer the fundamentals of international commercial arbitration, the most important dispute resolution mechanism for international business transactions. It will deal with the legal framework of international commercial arbitration, jurisdiction of arbitration tribunals and certain procedural issues arising in arbitration practice, and the setting aside and recognition and enforcement of arbitral awards.</p>	
Topics	
<ol style="list-style-type: none"> 1. Introduction to ADR and international commercial arbitration <ol style="list-style-type: none"> a. Definition b. Methods of dispute resolution c. Different kinds of arbitration d. Sources of law 2. Nature and forms of arbitration advantages and disadvantages for various clients 3. Basics of International Commercial Arbitration <ol style="list-style-type: none"> a. Essence and Regulatory Framework of International Commercial Arbitration. b. Juridical Nature of Arbitration. c. Arbitration Agreement – Autonomy, Validity, Interpretation. d. Arbitrability and Competence. e. Arbitration and the Courts. f. Arbitration and International Law. 4. Arbitration involving states 5. Arbitration laws and rules national and international instruments and Conventions. Hierarchy of the instruments, respect for party autonomy v nature of law. <ol style="list-style-type: none"> a. UNCITRAL Model Law. b. UNCITRAL Arbitration Rules. c. Brussels Convention I 6. Arbitrators and Arbitration Procedure <ol style="list-style-type: none"> i. International Centre for Settlement of Investment Disputes (ICSID) Convention and arbitration Rules ii. International Chamber of Commerce Arbitration Rules. iii. London Court of International Arbitration (LCIA Arbitration Rules) iv. Arbitration Institute of Stockholm Chamber of Commerce (SCC) Arbitration Rules <ol style="list-style-type: none"> a. Commencement of Arbitration. b. Selection and Appointment, Challenge and Removal of Arbitrators. c. Determination of Jurisdiction. d. Arbitration Procedure. e. Taking Evidence in International Commercial Arbitration. f. Interim and Conservatory Measures. g. Arbitration Award 7. Limitation of arbitrators authority 8. Objective and subjective arbitrability with specific focus on illegality, antitrust, securities and fraud. 9. Lex arbitri including critique of delocalised arbitration 10. Applicable substantive law and the validity of amiable composition. 11. Recognition and Enforcement of awards 	

a. New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards 1958.
• Reading Material
• Julian D M Lew, Loukas A Mistelis, Stefan M Kroll. Comparative International Commercial Arbitration. The Hague, 2003
• Greenberg, Kee and Weeramantry, International Commercial Arbitration, Cambridge University Press, 2011
• Moses, Principles and Practice of International Commercial Arbitration, Cambridge University Press, 2d ed, 2012
• Gary B. Born. International Arbitration: Law and Practice. The Hague, 2014.
• Redfern and Hunter on International Arbitration, Blackaby and Parasides, Student Version, Oxford University Press, 5th ed, 2009
• Jonathan Hill, Adeline Chong. International Commercial Disputes. Commercial Conflict of Laws in English Courts. Oxford, 2010.
• UNCITRAL Model Law on International Commercial Arbitration 1985.
• Convention for the Recognition and Enforcement of Foreign Arbitral Awards 1958
• UNCITRAL Model Arbitration Rules (as revised in 2010).
• Brussels Convention 1968.

Commercial Conflict of Laws	
Course	Elective
Class	LLM
Credit Hours	03
Course Code	LLM-744
Course Introduction	
<p>This course will involve a critical analysis of the conflict of laws rules dealing with issues arising in a commercial context. It will begin with jurisdiction and recognition and enforcement of foreign judgments and then deal with choice of law issues in contract and tort.</p>	
<p>The aim is to addresses three main questions in detail:</p> <ul style="list-style-type: none"> • In which country should the case be tried? • Which country's law should be applied to resolve the dispute? • What should be the legal effect in one country of a judgment given in another? 	
Topics	
<ol style="list-style-type: none"> 1. Theoretical importance and practical relevance of conflict of laws and private international law 2. International Jurisdiction on Individuals and Companies / Forum Shopping 3. The course and conduct of commercial litigation – law on Jurisdiction <ul style="list-style-type: none"> a. Brussels Regulation 2001 in EU • Key features of litigation - <i>Forum non conveniens</i> and anti-suit injunctions • Party autonomy and forum selection: choice of court clauses <ul style="list-style-type: none"> a. Hague Convention on Choice of Court Clauses 2005 b. Rome I Regulation 2008 in EU • Multi-fora litigation: lis pendens & related actions in parallel proceedings before different fora • Multiparty litigation: jurisdiction over Multinational Groups of Companies – Branches and Agents • Class Actions and similar forms of Collective Redress • Interface between Arbitration and Litigation • International Reach of National Legislation and Extraterritoriality • Provisional Measures and Freezing Orders • Enforcement of Foreign Judgments <ul style="list-style-type: none"> a. Convention on the recognition and enforcement of foreign judgments in civil and commercial matters 1971 • Litigation with State and State owned entities (half class) & Revision class (half class) 	

References

- R Fentiman, International Commercial Litigation (OUP 2010).
- T Hartley, on International Commercial Litigation, 1st edition (CUP 2009).
- Jonathan Hill, International Commercial Disputes in English Courts (3rd ed, 2005, Hart Publishing).
- L Collins, Essays in International Litigation and the Conflict of Laws (Clarendon Press, Oxford, 1994).
- J Fellas (Ed), Transnational Commercial Litigation and Arbitration, (Oceana 2004).
- H van Lith, International Jurisdiction and Commercial Litigation- Uniform Rules for Contract Disputes (Asser Press 2009).
- A Briggs, Civil Jurisdiction and Judgments, 5th edition (2009).
- Adrian Briggs, The Conflict of Laws (2nd ed, 2008, Clarendon Press).
- Cheshire, North and Fawcett, Private International Law, 14th edition (OUP 2008).

Shipping Contracts

Credit Hrs.	03
Class	LLM
Course Type	Elective
Course Code	LLM-745

Course Description**Description:**

There is a majority of contracts in the shipping industry such as contracts for carriage, contracts for goods, contracts for employment, contracts for building a ship. Contracts specification and drafting plays a vital role at shipping industry through various incorporated terms in the contracts. This Course aims to train the students to understand and draft the contracts of the shipping industry. The international and national precedents and contractual obligations shall be covered through this course.

Topics of Study

- Law of the Contract
- Registration and Ownership of a ship
- Ship building contracts
- Insurance Contracts
- Carriage of Goods Contracts
- Bill of Lading
- International Contracts of Sale
- Ship Finance Contracts
- International Commercial Terms
- Paperless Contracts / E-Contracts
- Employment/Crew Contracts
- Ship Charter
- Voyage and Carriage Contract

Recommended Readings

- 1) Simon Curtis, The Law of Shipbuilding Contracts (Lloyd's Shipping Law Library, Informa Law)
- 2) Baris Soyer (Editor), Andrew Tettenborn (Editor), Ship Building, Sale and Finance (Maritime and Transport Law Library, Informa Law)
- 3) David Osborne (Author), Graeme Bowtle (Author), Charles Buss (Author), The Law of Ship Mortgages (Lloyd's Shipping Law Library) Hardcover – 26 Sep 2016
- 4) Carr & Kidner, International Trade Law Statutes and Conventions 2011-2013, (Cavendish Press, 2011)
- 5) Todd, Cases and Materials on International Trade Law (Sweet & Maxwell, 2002)
- 6) Dockray, Cases and Materials on the Carriage of Goods by Sea, 3rd ed., (Cavendish 2004)

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| 7) | Marvin A. Chirelstein "Concepts and Case Analysis in the Law of Contracts" (University Textbook Series) 4th Edition |
| 8) | Sir David Steel "Legal Principles in Shipping Business 2016" (Published by, Institute of Charter Ship Brokers) |
| 9) | Arnold J. Goldman, William D. Sigismond, Cengage Advantage Books: Business Law: Principles and Practices (Cengage Advantage Books, Publishers) |

International Trade Law

Class	LLM
Course type	Elective
Credit Hours	03
Course Code	LLM-714

Course Introduction

This introductory course deals with structural aspects of the international trade law system, including the different municipal legal systems; the history of the international legal system; customary international law; treaty law and interpretation; the meaning and jurisprudence of international law statehood and recognition; international organizations such as the United Nations, the World Trade Organization, the IMF, World Bank, UNCTAD, UNCITRAL and ICSID as well as the relationship between the international legal system and domestic systems. In addition the course will review the legal vehicles available to facilitate international dispute resolution methods for governments and business entities. Specific attention is paid to the dispute resolution mechanism in the World Trade Organization, the International Centre for Settling Investor-State Disputes and International Commercial Arbitration. Finally the course briefly considers the concept of 'Choice of Law' for international trade contracts and the recognition of foreign awards and judgements through municipal courts.

International Trade Law is an elective course offered to final-semester LLB students. The objective of the course is to provide a broad overview of what is an extremely large and complex area of law, together with a more detailed consideration of certain key topics. The course follows the traditional format of lectures and class discussions and students are in addition expected to do a considerable amount of reading and research both in preparation for, and as follow-up to lectures.

Lecture attendance is compulsory, and a register will be taken at each lecture. If a student does, exceptionally, miss a lecture, that student must obtain a copy of the lecture notes and any handouts or references from a fellow student prior to the next lecture. It is every student's responsibility to attend all the lectures, presentations and discussion related to the subject.

Course Outline

Topic

Introduction

- The International Sale of Goods
- Special Trade Terms in Export Sale
- Free carrier
- Responsibilities of Parties in Contracts
Case: Paquete Habana 175US 677 (1900)
- Role of Sanction in IL
- Naturalist and Positivist
- International Law Vs International Comity.
- Is international law binding on states?

The International Sale of Goods

- Formation of Contract; The Negotiation
- Inquiries and Invitations to Contract
- The Quotation
- Tenders

- Parol Evidence
- *Performance of the Contract*
- Delivery of Goods/Passing of property

The International Sale of Goods

- Conditions, Warranties and Innominate Terms
- Relaxation of Strict Performance of Contract
- The Unpaid seller's Lien.
- *Frustration of Contract*
- Conditions Upon which the contract is frustrated
- Effect of Frustration of Contract
- The Law Reform (Frustrated Contracts) Act, 1943.

The International Sale of Goods

- Invoices and Packing
- Invoice must be true and correct
- The commercial Invoice
- Packing; Packing in the sale of Goods
- Packing in the Law of Carriage of Goods
- Packing in containers
- PRODUCT LIABILITY
- The basis of Product Liability
- Liability arising from the contract of Sale
- The EC Directive on Product Liability

Finance of Exports

- Bill of Exchange
- Payment on Open Accounts
- Nature of bill of exchange
- The UN Convention on International Bills of Exchange and International Promissory Notes (1988)
- *Collection Arrangement*
- The Uniform Rules for Collections
- Dishonour
- Delivery of Documents contrary to Instructions.

Finance of Exports

- Letters of Credit
- Characteristics of the Letter of Credit
- The stages of Letter of Transactions
- Kinds of Letter of Credit
- *Bank Guarantees and Other Contracts Guarantees in General*
- *Countertrade*
- Types of Countertrade Transactions
- Oil countertrade.

Transportation of Exports

- *Carriage of Goods by Sea*
- Bills of lading and other carriage Documents
- Types of bill of lading
- The Liability of carrier
- *Container transport*
- The course of business in container transport
- Legal problems of container transport

Transportation of Exports

<ul style="list-style-type: none"> • <i>Carriage of Goods by Air</i> • Damage during “Carriage by Air” • Carrier’s defences • Carriage governed by the original Warsaw Convention • <i>Carriage of Goods by Land</i> • Carriage by Road and
Insurance
<ul style="list-style-type: none"> • <i>Insurance of Goods in Transit</i> • Marine Insurance • Kinds of Marine Insurance • The Contract of Marine Insurance • Air Cargo Insurance • Marine Clauses • <i>Export Credit Guarantees</i> • The Export Credits Guarantee Department • Facilities offered by the ECGD • Buyer Credit Facility
International Commercial Dispute Resolution
<ul style="list-style-type: none"> • English Law and Foreign Law • Measures of Conflict avoidance • The Law governing the contract- The Rome Convention • Foreign Illegality; Civil and Criminal consequences. • Exchange Control • Recognition of foreign exchange control regulations
International Commercial Litigation; Jurisdiction
<ul style="list-style-type: none"> • Interpretation of the Judgments (and the Brussels and Lugano Conventions) • Insurance and Consumer Contracts • <i>Jurisdiction and Admissibility</i> • Traditional rules on Jurisdiction • The freezing injunction • The Hague Convention in Choice of Court Agreements.
Quiz & Dead line for submission of Assignment
International Commercial Arbitration
<ul style="list-style-type: none"> • The Contractual elements of Commercial Arbitration • ADR and Arbitration • Ad hoc and Institutional arbitration • ICSID • International Court of Arbitration • London Court of Arbitration • UNCITRAL model law on International Commercial Arbitration • The New York Convention • Enforcement of Foreign Judgements and Arbitral Awards • Recognition and enforcement of foreign judgments • New York Convention Awards
Grounds for refusal of recognition.
Construction and Long Term Contracts
<ul style="list-style-type: none"> • The construction of Work and Installation Abroad • The UNCITRAL Legal Guide • Types of Procurement

- Contract Structure
- Insurance and indemnity Clauses
- Arbitration and the resolution of disputes

The World Trade Organization

- History of the WTO and International Trade
- Discussion under the Doha Round
- WTO- relevant rules and codes already in force
- Understanding on rules governing the settlement of disputes
- DSU-rules and procedures
- Implementation of WTO agreements and ruling in EU law

Standardization, Unification, Electronic Commerce and EDI

- Standardization of Terms and Unification of International Sales Law
- Uniform rules of General Character
- UN commission on International Trade Law.
- The Uniform Law on International Sales
- The Uniform law on formation
- UN convention on Contracts for the International Sale of Goods (CISG, 1980)
- Electronic Commerce and Electronic Data Interchange
- Electronic Data Interchange EDI

Electronic Communications Act

Recommended Books

Private International Trade Law

- *Schmitthoff's Export Trade: The Law and Practice of International Trade* - (Carole Murray ed., 10th edn) – Thomson Sweet & Maxwell – London – 10th edn – 2007 – ISBN 9780421892804.
- Larry A. DiMatteo, *International Sales Law A Critical Analysis Of CISG Jurisprudence*
- *John Braithwaite and Peter Drahos*, *Global Business Regulation* - Cambridge University Press – Cambridge – 2000 – ISBN 052178499
- Michael G. Bridge, *The International Sale of Goods: Law and Practice* – Oxford University Press – Oxford – 2007 – ISBN 9780199273584
- Robyn Burnett and Vivienne Bath, *The Law of International Business in Australasia* - The Federation Press – Sydney – 2009– ISBN 9781862877245

General

- *Michael Pyles, Jeff Waincymer and Martin Davies, International Trade Law: Commentary and Materials* – Law Book Company – North Ryde – 2nd edn – 2004 – ISBN 0455 218900
- *Michell Sanson, Essential International Trade Law* – Palgrave Macmillan – North Ryde – 2nd edn – 2005 - ISBN 9781876905330
- *Indira Carr, International Trade Law* – Cavendish Publishing, London – 4th edn – 2010 – ISBN 9780415458436
- *Justin Malbon and Bernard Bishop, Australian export: a guide to law and Practice* – Cambridge University Press – Port Melbourne – 2006 – ISBN 9780521613958

World Trade Organization

- *Bhagirath Las Das, An Introduction to The WTO Agreements* - Zed Books Third World Network – Malaysia – 1998 - ISBN 1856495825
- *Peter Van den Bossche, The Law and Policy of the World Trade Organization: Text, Cases and Materials* – Cambridge University Press – 2nd edn – 2008
- *Robert E. Hudec, Essays on the Nature of International Trade Law* -Cameron May - London – 1999 – ISBN 1874698775
- *Walter Goode, Dictionary of Trade Policy Terms* - Centre for International Economic Studies University of Adelaide - 2002 – ISBN 0863964753
- *A. Hoda, Tariff negotiations and renegotiations under the GATT and the WTO: procedures and practice*

- *M. Rafiqul Islam*, International Trade Law of the WTO - Oxford University Press – Sydney – 2006 – ISBN 0195553284
- WTO: Guide to the GATS: an overview of issues for further liberalization of trade in services.

Dispute Resolution:

- *Anthony Connerty*, A manual of international dispute resolution – London –Commonwealth Secretariat – 2006 – ISBN 9780850928372
- *Vicki Waye (ed)*, A guide to arbitration practice in Australia – Adelaide Law School – Adelaide – 2nd edn – 2006 – ISBN 064645398X
- World Trade Organization: A handbook on the WTO dispute settlement system.
- World Trade Organization: World dispute settlement procedures. 2nd edn

Public International Law

- Shaw, Malcom N. *International Law*. (Cambridge: University Press, 2007).
- Malanczuk, Peter. *Akehurst's Modern Introduction to International Law*, 7th ed, (London: Routledge, 1997).
- Shearer, I.A. *Starke's Introduction to International Law*, 11th ed. (Oxford: University Press, 1994).

Relevant Cases

- Riko Deq case
- Rupali Hitachi Case
- Motorway Case in Pakستان
- WAPDA vs HUBCO
- Case of Argentina - Textiles and Apparel, WT/DS56/AB/R, Para. 79.
- Case of Korea - Dairy, Appellate Body Report, Para. 120.
- Case US rejected Indian's request to join in the consultation in, DS/213- United
- States of America — Countervailing Duties on Certain Corrosion-Resistant
- Carbon Steel Flat Products from Germany (Complainant: European Communities), (10 November 2000).

Marine Insurance

Credit Hour	03
Class	LL. M
Course Type	Elective Subject
Course Code	LLM-746

Course Introduction

This course will cover introduction to marine insurance, Duty of good faith, material disclosure, Insured perils, Types of marine insurance: insurance of ships, cargoes and freight, Latent defects, and Standard contracts of insurance in the marine market.

Topics

- Introduction to Marine Insurance and the market in which it operates.
- A historic view of the development of marine insurance and its origin as well as ancient rules and practices.
- Types of Marine Insurance (Hull, Cargo and Marine Insurance)
 - UNCTAD Model Clauses on Marine Hull and Cargo Insurance 1989
- Marine Insurance Markets.
- The role of Marine Insurance Broker
- Definitions of commonly used Insurance terms.
- What does marine insurance cover?
 - Hull and Machinery Insurance
 - Builders Risk insurance
 - Loss of hire insurance
 - War risk (insurance against risk of war)
 - P&I Insurance (covering liabilities that may occur in the course of trade)

- Excluded Losses (Willful misconduct, delay, ordinary wear and tear/inherent vice, war and strike risks).
- Proof of loss, privity and "blind eye knowledge" in the context of e.g. unseaworthiness.
- Protection and Indemnity Insurance.
- The Law of Marine insurance.
 - Marine Insurance as covered under Insurance Ordinance 2000
 - Marine Insurance Bill 2016
- Applicable Principles
 - Insurable Interest and subrogation.
 - Interpretation and rectification of Insurance Contracts.
 - The Doctrine of Utmost Good Faith in the context of pre-contractual disclosure; (materiality and inducement).
 - Post-contractual duty of Good Faith including claims (both valid and fraudulent) and variation/renewal of policy.
 - Remedies for breach of duty and possible reforms
 - Warranties, exceptions and implied terms.
 - Principles of Causation (Remote, Immediate and Proximate Causes).
- Enforcement of Maritime Claims
 - International Convention on Maritime Liens and Mortgages 1993
- Examples of Standard Marine Insurance Contract Terms and Conditions

Reading Material

- Marko Pavliha, 'Overview of Marine Insurance' International Maritime Law Institute' 2013.
- OzlemGurses, *Marine Insurance Law*, Routledge, 2015.
- Bennett H.N., *The Law of Marine Insurance*, Oxford Press, Oxford, 1996.
- Thomas D.R. (Editor), *Marine insurance: The Law in Transition*, Lloyd's of London Press, London, 2006.
- Thomas D.R. (Editor), *The Modern Law of Marine Insurance*, 2nd Edition, Lloyd's Press, London, 2002.
- Brown R.H., *Introduction to Marine Insurance: Training Notes for Brokers*, Second Edition, Witherby & Co. Ltd., London, 1995.
- Gilman J.C.B., *Arnould's Law of Marine Insurance and Average*, Sweet & Maxwell, London, 1997.
- Hodges S., *Law of Marine Insurance*, Cavendish Publishing Limited, London, 1996, reprinted in 2001.
- Hodges S., *Cases and Materials on Marine Insurance Law*, Cavendish Publishing Limited, London, 1999.
- Insurance Ordinance 2000
- Marine Insurance Bill 2016
- UNCTAD Model Clauses on Marine Hull and Cargo Insurance 1989
- International Convention on Maritime Liens and Mortgages 1993

Law of Marine Environment

Credit Hour	03
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Class	LL. M
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Course Type	Elective Subject
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Course Code	LLM-747
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Course Introduction

This course will examine the physical and chemical properties of the marine environment, the key principles of environmental law and specifically, marine environmental law.

Topics

- Introduction to the structure of shipping and offshore activities and the interests of coastal and flag states.
- Obligations imposed on coastal states to protect the marine environment.
 - Prescriptive and enforcement jurisdiction for coastal, flag and port states.
 - The conflicts between freedom of navigation and environmental protection.

- The MARPOL Convention 1973 (The International Convention for the Prevention of Pollution from Ships)
 - its enforcement and implementation. Contractual arrangements supporting MARPOL.
- Recycling of ships and exportation of hazardous cargo by ships.
- Basis of environmental liability.
 - The polluter pays principle, the no harm principle the precautionary principle.
 - The problems of recovery under national law.
- Liability for oil pollution from ships
 - Convention on Civil Liability for Oil Pollution Damage (CLC) 1969.
 - Convention on Civil Liability for Bunker Pollution Damage 2001
- The contribution of the oil industry
 - The Fund Convention 1971
- Liability for the carriage of hazardous and noxious substances
 - The International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention) 1996
 - The 2010 Protocol to the HNS Convention
- Jurisdiction for marine environmental harm
- Enforcement measures, arrest, security and limitation of liability.
- Pollution from ships and climate change.
- Governance of offshore installations, pipelines and offshore facilities
 - UN Convention on the Law of Sea (UNCLOS) 1982
 - Other regional agreements.
- Liability for pollution from offshore installations.
 - Recycling of offshore installations.
- To what extent would Pakistan Environment Protection Act 1997 apply?

Reading Material

- Andree Kirchner, *International Marine Environmental Law: Institutions, Implementation and Innovations*, Kluwer Law International, Hague.
- Howard S. Schiffman, 'International Law and the Protection of the Marine Environment' EOLSS.
- Guruswamy L. and Hendricks B. (1997). *International Environmental Law in a Nutshell*, St. Paul: West.
- Kiss A. and Shelton D. (2000). *International Environmental Law*. 2nd edn., 720 New York: Transnational.
- Nanda V.P. (1995). *International Environmental Law and Policy*, 458 pp. New York: Transnational.
- The International Convention for the Prevention of Pollution from Ships 1973
- Convention on Civil Liability for Oil Pollution Damage 1969
- Convention on Civil Liability for Bunker Pollution Damage 2001
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1971
- The International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea 1996
- UN Convention on the Law of Sea 1982
- Pakistan Environment Protection Act 1997

Crimes at Sea	
Credit Hour	03
Class	LLM
Type of Subject	Elective
Course Code	LLM-748

Course Description

With the increasing sophistication of transnational criminal organization, coupled with globalization and its heavy dependence on maritime transport, the suppression of criminality at sea has again become a priority on the international community's agenda. The idea of this course is to teach Crimes at Sea — an issue of both great practical importance and academic interest. There is a wide breadth area, some focusing on particular crimes at sea, others on the general international legal framework within which responses to criminality at sea operate. Throughout the volume, there is a common theme of regime interaction — exploring the limits and efficiencies resulting from the overlapping applicability of human rights law, international criminal law, the law of State responsibility and the UN Charter regime. The contributions both illustrate and clarify the significant links between these legal regimes which support the fight against crimes at sea.

Topics of Study

- Overview of transnational organized crime at sea
- Piracy and armed robbery at sea
- Private Armed Guards in the Fight against Piracy
- The contemporary threat of piracy and armed robbery
- Problems and challenges with regard to the suppression of piracy and armed robbery at sea
- Smuggling of migrants and human trafficking at sea
- Smuggling of migrants and human trafficking at sea
- Fisheries crime
- Illegal pollution of the marine environment
- Crime of Tax evasion
- Extradition and Mutual Legal Assistance in the Prosecution of Serious Maritime Crimes : A Comparative and Critical Analysis of Applicable Legal Frameworks
- War Crimes During Armed Conflicts at Sea (Responsibility & Jurisdiction)
- Shiprider Institution: Questions of Jurisdiction and State Responsibility
- Offenses Under the Hostage-Taking Convention
- Offenses Under the 1988 SUA Convention
- Offenses Under the 2005 SUA Protocol

Recommended Readings

- Efthymios D. Papastavridis Kinderley N. Trapp, Crimes at Sea / La criminalité en mer 2014
- Legal Framework for the Repression of Piracy Under UNCLOS
- United Nations Documents on Piracy
- Barry Hart Dubner , The Law of International Sea Piracy, BRILL 1980

Shipping Laws

Course Introduction

Credit Hour	03
Class	LLM
Type of Subject	Elective
Course Code	LLM-723

Shipping law is commonly referred as domestic law of the sea, in its broader perspective the Shipping law is concentrated over the trade through shipping. This area of Maritime Laws covers ship, the employees at ships (the crew), ship as the carrier of goods, and operation of vessels through the high-seas

TOPICS

1. Topic: International Regulation of Shipping – I
2. Hamburg Rules and Hague-Visby Rules

- | | |
|------------|---|
| 3. Topic: | International Regulation of Shipping – II |
| a. | Rotterdam Rules |
| 4. Topic: | Jurisdiction, Admiralty claims in Rem and in Personam |
| 5. Topic: | Merchant Shipping in context of Pakistan – I |
| 6. Topic: | Merchant Shipping in context of Pakistan – II |
| 7. Topic: | Operations through Constitution of Pakistan, 1973 & Rules of Business, 1973 |
| 8. Topic: | Ministry of Ports and Shipping and Depts Established Under the Ministry. |
| 9. Topic: | Carriage of Goods by Sea |
| 10. Topic: | Admiralty Law and Jurisdiction in Pakistan |
| 11. Topic: | Bill of Lading |
| 12. Topic: | Collusion at Sea |
| 13. Topic: | Salvage |
| 14. Topic: | Maritime Lien and Arrest of Ships – I -Local Perspective |
| | Topic: Maritime Lien and Arrest of Ships – International Perspective |
| 15. Topic: | Insurance and Claims |
| 16. Topic: | Revision |

Suggested Readings

Primary Sources:

- International Convention for the Unification of Certain Rules of Law relating to Bills of Lading (1924)/ First Protocol (1968)/ Second Protocol (1979)
- United Nations International Convention on the Carriage of Goods by Sea
- United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea
- Maritime Security Agency Act, 1994
- Merchant Shipping Ordinance, 2001
- Inland Mechanically Propelled Vessels Act, 1917
- Constitution of Pakistan, 1973
- Rules of Business, 1973
- Admiralty Jurisdiction of High Court of Sindh and Balouchistan Act, 1981
- Bill of Lading Act, 1856
- Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972

Books:

- Douglas Guilfoyle, "Shipping Interdiction and the Law of the Sea" Series: Cambridge Studies in International and Comparative Law (No. 63)
- Donald R. Rothwell, Tim Stephens, The International Law of the Sea (Hart Publishing)
- Carr&Kidner, International Trade Law Statutes and Conventions 2011-2013, (Cavendish Press, 2011)
- Wild, 150 Leading Cases: Conflict of Laws, (Old Bailey Press, 2004)
- Todd, Cases and Materials on International Trade Law (Sweet & Maxwell, 2002)
- Dockray, Cases and Materials on the Carriage of Goods by Sea, 3rd ed., (Cavendish 2004)

5. Eligibility

- The HEC Minimum Quality Criteria for M. Phil level studies in Pakistani Universities / Degree Awarding Institutions shall be applied to LL.M. Degree Programme.
- The admission to the LL.M. degree programme shall be open to the candidates only who have secured 'Second Division' in LLB with at least 55 percent aggregate or have a minimum CGPA of 3.00.
- In addition, a candidate must pass a GRE/GAT type test including English, General Knowledge and Law.

6. Number of LL.M Students

According to HEC, the maximum limit for enrolment in the LL.M. programme shall not exceed 20 in a session.³ However, the Department of Law will start the programme with at least 10 students

7. Resource Persons (Not Exhaustive)

No	Names of the Recourse Persons	Qualification	Position and Institution	Experience
1.	Osman Karim Khan	LLM Maritime Law	Senior Prosecutor, NAB Visiting Faculty, IIUI	15 Years
2.	Talha Mushtaq	LL.M Maritime Laws	Legal Practitioner	07 years
3.	Muhammad Ahsan Ghani Siddiqui	LLB, BSc. Marine Engineering	Former Marine Engineer, International Trade and Maritime Law Practitioner	25 years
4.	Dr. Pervaiz Khan	PhD International Economic Law	Assistant Professor	3 years
5.	Malieka Farah Deeba	LLM International Economic Law	HoD Law Assistant Professor	14 Years
6.	Saadia Zahoor	LLM International Law	Senior Lecturer, Bahria University, Islamabad	07
7.	M. Jahanzeb Butt	LLM International and Maritime Laws	Lecturer at Law, Bahria University Islamabad	05 years

8. HEC Criteria for LLM Degree Programme

- 7.1. The HEC Minimum Quality Criteria for M. Phil / Ph.D. level studies in Pakistani Universities / Degree Awarding Institutions shall be applied to LL.M. Degree Programme.
- 7.2. The admission to the LL.M. degree programme shall be open to the candidates only who have secured 'Second Division' in LLB with at least 55 percent aggregate or have a minimum CGPA of 3.00. In addition, a candidate must pass a GRE type test including English, General Knowledge and Law.
- 7.3. The LL.M. programme shall be based on semester system, having four semesters. The LLM classes shall be held only in the morning hours.
- 7.4. Corresponding to an M. Phil degree, the LL.M. degree programme shall be of thirty credit hours (Twenty-four credit hours for the coursework and six credit hours for the thesis / dissertation)
- 7.5. The maximum limit for enrolment in the LL.M. programme shall not exceed 20 in a session.
- 7.6. The pass marks in an individual course shall be fifty percent the aggregate marks in all courses shall not be less than sixty percent.
- 7.7. The LL.M. programme shall be separated from the LL.B. and would be under the supervision of a departmental 'Director of Graduate Studies' to be appointed by the university concerned.

³Higher Education Commission, Curriculum of LL.M (Revised 2006)

<http://www.hec.gov.pk/InsideHEC/Divisions/AECA/CurriculumRevision/Documents/LLM%202006.pdf>
<Accessed: 21st April, 2016).

7.8. Candidates seeking admission to the LL.M. degree programme shall be ‘full-time’ students. Those in service will be required to take ‘study leave’ or those in legal profession will have to get their licences ‘suspended’ during the course of their studies.

7.9. An institution may offer LL.M. degree programme if;

- Its faculty is fully qualified i.e. only those having LL.M. degrees will be eligible to teach or supervise research thesis. Young faculty-members having LL.M. degree may be encouraged to teach and supervise LLM students;
- Its Library is of very high standard and subscribes to international journals accredited by the HEC;
- Its follows the courses and course materials are clearly prescribed by HEC; and
- It has adequate numbers of ‘Research Supervisors’ for the supervision of research work of the students.

TRANSCRIPT OF PRESENTATION BY HOD LAW BUIC

Slide-1

Item no 3014

LLM in international and Maritime Laws

30th ACM Launch Proposal

Slide-2

International and Maritime Laws

- The world remained dependent on the high seas for transportation and shipping.
- Over 90 percent of international trade is carried out by sea, and the volume of goods shipped is increasing every year.
- Given the economic importance of the industry, it is no surprise to find many lawyers specializing in Maritime Law in governments, international organizations, and the shipping and litigation departments of law firms around the world.
- There are only 15 LL.M programs worldwide that offer a focus on Maritime Law.
- Maritime Law LL.M. programs offer similar sets of courses: Admiralty Law, Marine Insurance, Carriage of Goods by Sea, Law of the Sea, Shipping Regulation, as well as courses covering shipbuilding/marine construction, salvage, towage, collisions, liability, international arbitration and overall aspects of International Trade and Economic Laws.
- Some programs have also integrated environmental law components.

Slide-3

Law schools around the world offers

- University of Tulane (research university) Law School is the only law school in USA offers LLM in Maritime major.
- Most other programs are taught in Europe and Britain, including those at Bristol, Nottingham, Southampton, and Swansea, and the specialized institutes at the University of Oslo and the International Maritime Law Institute in Malta.
- A few other programs are located in major commercial ports like Rotterdam, Cape Town, and Athens, where City University London plans to expand their Maritime Law program. Due to the growing importance of Singapore (and Asia as a whole) in shipping, the National University of Singapore (NUS) began an English-language Maritime Law program in 2007.

- China is also focusing to amend, revise and update its 1984 Maritime Traffic Safety Law after CPEC activities.
- Swansea and Southampton whose maritime LL.M. programs take on some 150 and 90 students per year are generally considered to be the most relevant schools for maritime law and research.

Slide-4

Introduction

- Department of Law is already running two years LLM (General) program.
- The point of specialization has always been in discussion on different forums.
- Bahria University will be the first institution in Pakistan to start this program.
- The Program is an opportunity to fill the vacuum in the field of maritime laws and demand of maritime legal experts that surge from the increase in economic activities in the country like CPEC.
- The Idea is also providing a flagship to Bahria University as Institute of Pakistan Navy.

Slide-5

Background

- The idea was initially perceived at many informal interactions with the industrial officials.
- We initially thought about diploma courses and certificate courses on Maritime Laws.
- Gradually we started getting the feedback at formal interactions with the industry and legal fraternity i.e., CAC.
- We also conducted an online survey to get the feedback from law specialists and amazingly they were very appreciative about it.
- Formally we first time brought up this matter in our meeting with the Hon'ble Rector.
- Go ahead for further deliberation is in place.
- Subsequently we held a special CAC where we invited international and maritime law specialists Mr. Ahmer Bilal Sufi and Mr. Osman Karim Khan to consider the industrial scope of the program. There was very positive response from the members.

Slide-6

Mission Statement

- LLM in Maritime Laws is going to be one of the core program at Bahria University with the focus of training lawyers and researchers working in the field of International Maritime, International Trade, International Economic and Maritime Research.
- This program is also opening gates for the researchers, specifically maritime law experts, to fill in the lacunas of the Pakistan Maritime Regime.

Slide-7

Objectives of the Program

- This is an opportunity to diversify the Masters Degree of Law and being the pioneer of teaching Maritime Laws in Pakistan.
- To equip the lawyers/law students to research in Maritime Law Policy and its formulation.
- To train lawyers/law students to better understand the legal regime of CPEC.

Slide-8

Outcomes of the Program

- Establishing new research area.
- Attraction attached with CPEC.
- Building the image of Bahria University legal studies, catering issues regarding Maritime Law Industry.
- Filling the market gap.
- Establishing connections with the Maritime Industry.

Slide-9

HEC Requirement for NOC

- Its faculty is fully qualified i.e. only those having LL.M. degrees will be eligible to teach or supervise research thesis.
- Young faculty-members having LL.M. degree may be encouraged to teach and supervise LLM students.
- Its Library is of very high standard and subscribes to international journals accredited by the HEC.
- Its follows the courses and course materials are clearly prescribed by HEC; and
- It has adequate numbers of ‘Research Supervisors’ for the supervision of research work of the students.

Slide-10

HEC Requirement for NOC (Contd.)

LLM Rules 2006 *inter alia* provide “The Committee decided to include more areas to make the programme broad-based, multidisciplinary and flexible. The Universities and the Law Colleges may include new subjects in accordance with the expertise available subject to the approval of HEC”.

Slide-11

Pakistan Bar Council for LLM

Rule 13 Pakistan Bar Council 2015

Legal Education at the level of LL.M/Ph.D:

Rule 13 (i)

A University/Degree Awarding Institution intending to impart legal education at the level of LL.M. shall have to seek prior permission and approval of the Pakistan Bar Council and the Higher Education Commission for which the University/Institution shall have to submit an application to Pakistan Bar Council giving details and justification of doing so together with list of Faculty Members to be engaged for that purpose. Such an application shall be accompanied among other documents, the fee of Rupees One Million.

Slide-12

Rule13(ii)

“In the event of the permission/approval being granted under clause (i) above the University/Institution shall have to impart legal education for LL.M. as per the syllabus duly prescribed and approved by the Pakistan Bar Council and the Higher Education Commission and as modified by them from time to time”.

Slide-13

Rule 13(iii)

"The University/Institution shall only start LL.M. class after it is so allowed by the Pakistan Bar Council/Higher Education Commission as per the syllabus and the list of Faculty Members approved by them in that regard".

Slide-14

The mandate of the PBC is not clear on specialization in LLM separate recognition.

There are examples of other universities which are running specialized LLM program without getting approval from PBC.

Slide-15

Description of the Program

- LLM is partial research degree
- Total 30 credit hours
- Coursework of 24 credit hours
- Research work/thesis/dissertation of 6 credit hours
- Duration 2 years
- Venue: BUIC
- Timings: Day time
- Mode of study: Semester System
- Examination Requirements: HEC LLM Rules 2006 (referred)

Slide-16

Intake

- Criteria: LLB Degree 55% (Annual System) and 3 CGPA (Semester System). (HEC Rules)
- Expected intake of students: 10 – 15
- Subsequent intake plan: 20 – 25
- Proposed Date: Spring 2018

Slide-17

Requirement/Requisites

- Faculty: Visiting Faculty Members as mentioned in Appendage.
- Books: 1 Million (as already approved annual budget for law library book stock).
- Advertisement: to be advertised along with LLM (General) Program, as already being advertised.

Slide-18

Scheme of Studies

- 4 Semesters
- 2 for Coursework
- 2 for Research work/thesis/dissertation

Compulsory Courses

1. LLM – 700 Research Methodology
2. LLM – 740 Public International Law
3. LLM – 741 International Maritime Laws
4. LLM – 742 Carriage of Goods by Sea

Slide-19

Elective Courses

5. LLM – 743 International Commercial Arbitration
6. LLM – 744 Commercial Conflict of Laws
7. LLM – 745 Shipping Contracts
8. LLM – 714 International Trade Law (already approved)
9. LLM – 746 Marine Insurance
10. LLM – 747 Law of Marine Environment
11. LLM – 748 Crimes at Sea
12. LLM – 723 Shipping Laws

Research Work/Thesis/Dissertation

Slide-20

Resource Persons

- Osman Karim Khan (LLM Maritime Laws) Visiting Faculty Member/Senior NAB Prosecutor (15 years of experience)
- Talha Mushtaq (LLM Maritime Laws) Legal Practitioner (7 years of experience)
- Justice (R) Shahid Usmani (Practicing in Maritime) Sindh High Court Special Judge Admiralty Jurisdiction
- Justice (R) Muhammad Ahsan Ghani Siddiqui (LLB, BSc Marine Engineering) Maritime Law Practitioner (25 Years of experience)
- Dr. Pervez Khan (PhD International Trade Laws) Assistant Professor (3 years of experience)
- Dr. Nadia Khadam (PhD in Criminology) Sr. Assistant Professor
- Dr. Saadia Zahoor (PhD International Law) Senior Lecturer (7 years of experience)
- M. Jahanzeb Butt (LLM International and Maritime Laws) Lecturer (5 years of experience)
- Malieka Farah Deeba (LLM International Economic Laws) HOD Law, Assistant Professor (14 years experience).

Appendage 3016**Diploma Programs at the Department of Law****DIPLOMA COURSE IN INTELLECTUAL PROPERTY LAW AND PRACTICE (IPL&P)****INTRODUCTION**

Centrally located in Islamabad, Bahria University is a public sector university which offers quality education in a range of disciplines including Law. The department of Law BU is successfully running LL. B 5-years program, LLM and Diploma in Human Rights Law and planning to launch a diploma program in Intellectual Property Law and Practice. **This diploma will be offered during the Fall/Spring Session.**

MISSION

To advocate for the realization, protection and promotion of Intellectual Property Law, Rights and Practice in Pakistan and to outreach the violation and abuse of IPR's, its genesis in business, competition, copyrights and other modern trends in the relevant sector.

OBJECTIVE

This course provides graduates with an understanding of the principles of the registered trade mark system, copyright, geographical indications, the protection of unregistered marks and related forms of protection against misleading or unfair trading conduct regarding IPR's in Pakistan. In addition, graduates understand the content and implication of a patent specification, enabling them to advise upon possible questions of infringement, validity and compliance. The course will further enhance their capabilities related to IP awareness and practice in the relevant sector.

PROPOSAL FOR LAUNCHING

A. ACADEMIC DETAILS	
1	Faculty/Department: LAW
2	Name of the Programme: Diploma in Intellectual Property Law and Practice
3	Mission of the Programme: To acquaint the students with corporate sector with core Intellectual Property Law and Practice, theory, procedures and other related issues.
4	Objectives of the Programme: The Intellectual Property Law and Practice regime emerges from the substantive obligations expressed in IPR related treaties and relevant legislations, and their interpretation. The application by IP treaties and particularly their dispute settlement mechanisms is one of the core objective of the modern era legal regime in IPL&P.
5	Outcomes of the Programme: The diploma course will offer a graduate level treatment of Intellectual Property Law and Practice. It will be dealt with both substantive and procedural aspects of Intellectual Property Law, exploring its theoretical foundations, practical implications and relevant interpretation.
6	Rationale for the Programme: Intellectual Property Law is one of the fastest-developing areas of law. It is an area that combines elements of Patents, Copyright, Trade Marks and Geographical Indications subject to relevant treaties, public policy, and economic factors. In past decades, there has been a dramatic increase in the number of IP related issues at global and domestic level, followed by a sharp rise in the number of disputes between the stakeholders under those specialized legal regimes.
7	Brief Description of the Programme:
8	Duration: 2 Months
9	Venue(s): Department of Law, Bahria University, Islamabad Campus.
10	Programme Scheduling Format: Evening/Weekends
11	Proposed Date of Commencement: Fall-2018
12	Mode of Study/Examination:

	Lecture, group discussion, assignments, case studies, videos, seminars, guest lectures and research writing and registration procedures.
13	Additional Faculty Member(s) Required: Experts from relevant sectors shall be invited while there will be high reliance on permanent faculty.
14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) NIL
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) NIL
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) NIL
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: The Department of Law is well-equipped regarding online repositories.
18	Minimum Entry Level:
19	Admission Criteria: Admissions to BU Programs are given totally on merit. The candidate must possess a bachelor's Degree from any recognized university/institute. Candidates having intermediate or equivalent along with five years' relevant experience may also be considered.
20	Additional/Different Examination Requirement (<i>Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue.</i>). Evaluation is based on a paper on a relevant topic of each student's choice, subject to professor/faculty approval. It is expected that each student will make a class presentation on the topic of his or her paper.
21	Number of Admissions Expected for First Intake: 30-35
22	Number of Admissions Planned/Expected for Subsequent Intakes: 30-35
23	Referred by: (<i>delete which is inapplicable</i>) FBOS: (<i>Indicate the FBOS meeting reference and Item No</i>) Competent Authority: (<i>Indicate the File No & date; reproduce the decision</i>)
24	Complete Plan of Studies, inclusive of complete Roadmap: As Above
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) Provided above
B. FINANCIAL DETAILS	
19	Source of Funding: • <u>BU: Fully</u>
20	Diploma Duration: 2 months Total Number of Credit Hours: 24 Hours
21	Expected fee to be charged based on Cost & Benefits Analysis: (<i>show working</i>) Diploma fee: 30,000/-
22	Expected Number of students for 1st & 2nd Intakes: 30-35 students
23	Expected Earning from first two Intakes (B5): (<i>Show working</i>) If 30 students the fee will be collected 0.6 million including cost.
24	Expected Earnings for the Next Five Years (B6): (<i>show working</i>) 3 million
25	Total Estimated Salaries of all Additional Human Resources in diploma session (B7): (<i>Show working</i>) 2000-3000 per hour for visiting and will be subject to the call of visiting faculty

26	Cost of Additional Laboratory Equipment/Tools (B8): (<i>show working</i>) NIL
27	Cost of Additional Classrooms (B9): (<i>Include furniture, technical aids etc</i>) NIL
28	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (<i>show details</i>) NIL
29	Off-Site rental Expenses and Cost of other Fixtures (B11): (<i>Show details</i>) NIL
30	Miscellaneous Expenses required for Starting the Program (B12): <ul style="list-style-type: none"> - Advertisement: - Printing & Stationery - Admin Cost - Any other - Total
31	Annual Recurring Expenditures in Subsequent Years (B13): <ul style="list-style-type: none"> - Salaries: - Rentals: - Subscriptions/Memberships: - Advertisements: - Printing & Stationery: - Admin Cost - Any other - Total:
32	Total Cost of the Programme (B14): [Add B(7) to B(12)]
33	Net Cost of the Programme (B15): [Subtract B(1) from B(14)]
34	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] 0.6 Million
35	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>)
36	Projected Annual Net Earning in Subsequent Years: [<i>Subtract B(13) from B(17)</i>]

METHODOLOGY

Lecture, group discussion, assignments, case studies, videos, seminars, guest lectures and research writing and registration procedures.

COURSE DURATION/DAYS

The program spreads over a term of 02 month. Lectures will be conducted on, Thursday evenings (5:00 pm to 8:00 Pm).

FEES STRUCTURE

Total Fee is Rs. 30,000/- (subject to confirmation)

ELIGIBILITY

Admissions to BU Programs are given totally on merit. The candidate must possess a bachelor's Degree from any recognized university/institute. Candidates having intermediate or equivalent along with five years' relevant experience may also be considered for the IPL&P.

EVALUATION AND GRADING

The performance of participants will be evaluated through unseen exam (60%) and the research work (40%). Following is the evaluation grading formula in Numerical Value Grade Points:

A: 87-100, **B+:** 80-86, **B:** 72-79, **C+:** 66-71, **C:** 60-65, **D:** 50-59, **F:** Below 50

Focal Person: Mam Malieka Farah Deeba (Sr. Assistant Professor and Head of Law Department) and Adnan Khan (Senior Lecturer in Law) Email: hodlaw.buic@bahria.edu.pk, adnan.buic@bahria.edu.pk, adnankhaniiui@gmail.com

COURSE DETAILS

Comprising 02 months, this diploma course will be offering a number of Intellectual Property related up-to date courses. Following is breakup of the several modules with respective length (credit hours) and the course outcomes.

No	Module	Course objectives	Resource Person/Material
1	Legal process and Overview of Intellectual Property	<i>Overview of Intellectual Property</i> provides a general summary of the various legal regimes regarding intellectual property.	Copyrights, Trademarks, Patents, Designs, Utility Models, Trade Secrets and Geographical Indications IPR in Pakistan (Historical background of IPL)
2	Trade Mark Law Trade Mark Practice	This subject builds on the material covered in the <i>Trade Marks and Unfair Competition</i> subject. <i>Trade Mark Practice</i> is primarily concerned with the procedures and practices of the Pakistan Trade Marks Offices in obtaining and maintaining registered trade marks	Trade Mark related Law and Practices in Pakistan
3	Patent Law, Patent system Interpretation and Validity of Patent Specifications	The subject follows on from Patent law and patent system provides students with the basic knowledge and skills required for the filing, prosecution and maintenance of an application for protection of invention.	Patent Legal Regime in Pakistan
4	<ul style="list-style-type: none"> • Copyright Law and Practices • History and Nature of Copyright • Types of Work Eligible for Copyright Protection • Requirements for Subsistence of Copyright: 	Aims to introduce the students with Copyright Law and Practices.	Pakistani Legal Regime Copyrights Ordinance Copyrights Rules Copyrights Hearings Copyrights Publications
5	Geographical Indications	The students will learn through this module about geographical Indications and their practice and protections.	Respective provisions of the Relevant Laws and treaties which provides protections to Geographical Indications.
6	Design Laws Requirements for Patentability Design Protection	Design plays a critical role in the production and marketing of goods. Adequate protection of designs is important in order to encourage the creation of	Design Laws and Related Legal Regime in Pakistan

	Design Administration	innovative products and thus enhance the Pakistan's economy.	
7	Research Assignment	To acquaint the participants with the research methods and the skills of report writing.	

**List of Recourse Persons for lectures in the Diploma Course on Intellectual Property Law
Resource Persons for the Lectures:**

No	Names of the Recourse Persons	Qualification	Position and Institution	Experience
1	Mam Malieka Farah Deeba	LLM	Sr. Assistant Professor of Law. Head Department of Law, Bahria University Islamabad	14 years
2	Dr. Aziz-ur-Rehman	Ph.D in IP Laws	Assistant Prof. of Law, International Islamic University Islamabad	14 years
3	Mr.Aamir Latif	LL.M from IIU LLM from Italy	Deputy Director Legal, IPO, Pakistan	8 years
4	Dr Parvez Khan	PhD Law from UNSW, Australia	Assistant Professor of Law, Bahria University, Islamabad	08 years
5	Dr Tauseef Iqbal	PhD in Corporate Law from France	Sr. Assistant Professor of Law, Bahria University Islamabad	03 Years
6	Adnan Khan	LLM in Corporate Law, PhD Law(Theses Writer)	Senior Lecturer in Law, Bahria University, Islamabad.	05 Years

CURRICULUM GUIDE ON INTELLECTUAL PROPERTY LAW

- **The practice of intellectual property law** — Consisting largely of the law of trademarks, copyrights, and patents — has grown dramatically in recent years, spurred in large part by technology and the global economy. Intellectual property refers to creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.
- *Trademark Law* encompasses both registered and unregistered marks that identify goods as well as services or organizations, and includes words, images, shapes, sounds and smells in the Pakistan IP legal regime.
- *Copyright Law* provides protection to those who create literary, musical and dramatic works, pictorial, sculptural and audiovisual works, and other kinds of works of authorship, including computer programs. The owner of a copyright has the exclusive right to reproduce and distribute copies of the copyrighted work, and to prepare derivative works (adaptations, translations, etc.) based on the copyrighted work.
- *Patent law*, which protects inventions, conventionally is subdivided by technology, such as biotechnology, chemistry, electronics and computers. Practice in this area is often divided between prosecution or the acquisition of rights —and enforcement, including litigation, alternative dispute resolution and licensing.
- *Geographical Indications*
- **Entertainment Law and IPR**
- **Intellectual Property and International Trade**

PRESENTATION TRANSCRIPT OF HOD LAW BUIC

Slide -1

ITEM NO 3016 DIPLOMA IN INTELLECTUAL PROPERTY LAW AND PRACTICE

30th ACM

Launch Proposal

Slide -2

Introduction

- The department of Law BU is successfully running Diploma in Human Rights Law and planning to launch a diploma program in Intellectual Property Law and Practice.
- This diploma will be offered during the Fall/Spring Session 2018.

Slide -3

MISSION

- To advocate the realization, protection and promotion of Intellectual Property Law, Rights and Practice in Pakistan and to outreach the violation and abuse of IPR's, its origin in business, competition, copyrights and other modern trends in the relevant sector.
- To apprise the students with corporate sector with core Intellectual Property Laws and Practice, theory, procedures and other related issues.

Slide -4

OBJECTIVE

- An understanding of the principles of the registered trade mark system, copyright, geographical indications, the protection of unregistered marks and related forms of protection against misleading or unfair trading conduct regarding IPR's in Pakistan.
- In addition, candidates will understand the content and implication of a patent specification, questions of infringement, validity and compliance.
- Capabilities development related to IP awareness and practice.

Slide -5

Outcomes of the Programme

- The diploma course will offer a graduate level treatment of Intellectual Property Law and Practice
- It will be dealt with both substantive and procedural aspects of Intellectual Property Law, exploring its theoretical foundations, practical implications and relevant interpretation
- The programme will provide students with essential knowledge about the theoretical rationales and policy arguments for the recognition of intellectual property rights
- It will explain the basic principles of Intellectual Property Law and the nature and scope of these rights
- It will also explore the procedures, both national and supranational, for the granting and recognition of the rights, and mechanisms for enforcement as well as defenses against enforcement.

Slide -6

Rationale for the Programme

- Intellectual Property Law is one of the fastest-developing areas of law.
- It is an area that combines elements of Patents, Copyright, Trade Marks and Geographical Indications subject to relevant treaties, public policy, and economic factors.
- In past decades, there has been a dramatic increase in the number of IP related issues at global and domestic level, followed by a sharp rise in the number of disputes between the stakeholders under those specialized legal regimes.
- Basic knowledge of IP enforcement is almost important in all disciplines.

Slide -7

METHODOLOGY

Lecture, group discussion, assignments, case studies, videos, seminars, guest lectures and research writing and registration procedures.

Slide -8

COURSE DURATION/DAYS

The program spreads over a term of 3/4 months. Lectures will be conducted on, Weekdays Evenings-Weekends (5:00 pm to 8:00 Pm).

Slide -9

FEE STRUCTURE

Total Fee is Rs. 30,000/- (subject to approval).

Slide -10

ELIGIBILITY

The candidate must possess a bachelor's Degree from any recognized university/institute. Candidates having intermediate or equivalent along with five years' relevant experience may also be considered for the IPL&P.

Slide -11

Intake

Expected intake of students: 30/35

Slide -12

Requirement/Requisites

Books: Cornelius Law Library and main Library is well-equipped in this area of research.

Advertisement: As per practice.

Slide -13

Scheme of Studies

- Legal process and Overview of Intellectual Property
- Trademark Law, Trademark Practice

- Patent Law, Patent system
- Interpretation and Validity of Patent Specifications
- Copyright Law and Practices
- History and Nature of Copyright
- Types of Work Eligible for Copyright Protection
- Requirements for Subsistence of Copyright
- Geographical Indications
- Design Laws
- Requirements for Patentability
- Design Protection
- Design Administration
- Research Assignment

Slide -14**Resource Persons**

No	Names of the Recourse Persons	Qualification	Position and Institution	Experience
1	Malieka Farah Deeba	LLM	Assistant Professor of Law. Head Department of Law, Bahria University Islamabad	14 years
2	Dr. Aziz-ur-Rehman	Ph.D in IP Laws	Assistant Prof. of Law, International Islamic University Islamabad	14 years
3	Mr.Aamir Latif	LL.M from IIU LLM from Italy	Deputy Director Legal, IPO, Pakistan	8 years
4	Dr Parvez Khan	PhD Law from UNSW, Australia	Assistant Professor of Law, Bahria University, Islamabad	08 years
5	Dr Tauseef Iqbal	PhD in Corporate Law from France	Sr. Assistant Professor of Law, Bahria University Islamabad	03 Years
6	Adnan Khan	LLM in Corporate Law, PhD Law(Theses Writer)	Senior Lecturer in Law, Bahria University, Islamabad.	05 Years

Appendage 3017**Proposal on Introduction of an MS Program in Economics****Discussion:**

The discussion regarding Strategic Plan of Bahria University Islamabad campus has highlighted the importance of introduction of new MS programs along with the existing ones. In order to meet the challenges of the competitive market, there is a need to bring diversity in the university advance programs. It is therefore suggested to introduce MS Economics in the upcoming semester. The MS Economics program helps students to think logically and improve their ability to use economic and fiscal concepts to analyze “real world” problems and opportunities. This is a unique program that emphasizes qualitative and quantitative approach to dealing with economic and fiscal problems in both the public and private sectors. Currently its being offered by Quaid-I-Azam University Islamabad, International Islamic University, NUML, NUST and COMSATS Islamabad.

The application form for Launch of new academic program is attached as Annexure – A.

The Roadmap, course description and course contents are attached at Annexure – B.

Financial Implications:

15 MS students will be inducted in the first semester, which are sufficient for the start-up of new program. Details are provided in the Annexure-C.

HR Implications:

There is no HR implication, as the existing university faculty and administrative staff will be sufficient for the said purpose. Details are provided in the Annexure – B.

Recommendations:

The FBOS in its 14th meeting recommended placement of the agenda for Launch of MS Economics program before the ACM.

Annexure A**PROPOSAL FOR LAUNCHING MS ECONOMICS**

A. ACADEMIC DETAILS	
1	Faculty/Department: Management Sciences
2	Name of the Programme: MS Economics
3	Mission of the Programme: To produce economists as a capacity building for the affluence of our country by providing state of the art facilities to learn new research techniques in the field of economics.
4	Objectives of the Programme: There is an intense awakening that sound economic policies for any country require the services of highly trained economists, having analytical ability and problem solving skills. It is a well-recognized fact that application of new ideas and economic theory leads to create new knowledge; one of the main objectives and contribution of universities for which these institutions are meant for. The MS in Economics will ensures development of the skills needed for variety of services in the education sector, international institutions and public sector. The program aims at to foster advanced education and training in Economics. It will eventually develop teamwork, experiential skills, research skills and ability to communicate effectively. This program will strategically train up ambassador learners to build knowledge, skills, competencies and experiences. This program will meet market demands and also enhance intellectual ability of students.
5	Outcomes of the Programme: The Master in Economics is addressed to all those who want to become future leaders and professional in the education sector, international institutions and public sector. The program is designed for:

	<ul style="list-style-type: none"> • In-career personnel as well as fresh university graduates who are keen to acquire critical knowledge and skills in areas related to Economics and finance. • Managers and financial specialists in public and private organizations who wish to broaden the span of their knowledge and opportunities in the economy of Pakistan.
6	<p>Rationale for the Programme:</p> <p>The Strategic Plan of Bahria University Islamabad campus has highlighted the importance of introduction of new MS programs along with the existing ones. In order to meet the challenges of the competitive market, there is a need to bring diversity in the university advance programs. It is therefore suggested to introduce MS Economics in the upcoming semester. The MS Economics program helps students to think logically and improve their ability to use economic and fiscal concepts to analyze “real world” problems and opportunities. This is a unique program that emphasizes qualitative and quantitative approach to dealing with economic and fiscal problems in both the public and private sectors. Currently its being offered by Quaid-I-Azam University Islamabad, International Islamic University, NUML, NUST and COMSATS Islamabad.</p>
7	<p>Brief Description of the Programme:</p> <p>The MS in Economics is designed to provide rigorous training in economic theory, its techniques and applications, and in quantitative research methods. This program provides the advanced knowledge and skills required for a career as a professional economist in public service or the private sector. The program offers compulsory courses in the core areas of microeconomics, macroeconomics and econometrics. Other courses called option courses are taught along with it. The option courses are designed to develop knowledge and understanding of theory, techniques and debates within specialist fields of economics. It trains and prepare the student to undertake research. The programme offers a range of advanced options courses in macroeconomics, microeconomics and econometrics covering recent developments in theory and analytical techniques. These includes Development economics, Fiscal and Monetary economics, Financial economics, International trade, Urban economics and Public economics.</p> <p>The M.Phil Program at the Pakistan Institute of Development Economics (PIDE) has been developed to provide the necessary facilities for training economists in Pakistan. Given the asymmetrical situation whereby only a small percentage of the entire population has access to higher education, it is hoped that the M.Phil program at PIDE would be a step forward in a critical field of knowledge and expertise. This program is aimed at imparting a full range of knowledge, awareness and expertise in economics to meet the emerging challenges, as well as equipping students with the analytical tools necessary for policy-oriented research.</p>
8	Duration: 2.0 Years
9	Venue(s): On Site/Off Site/Both On & Off Site (<i>tick one/strike-through the ones not applicable; if Off Site, give details</i>)
10	<p>Programme Scheduling Format:</p> <ul style="list-style-type: none"> • Morning/Evening/Weekend (<i>tick one/strike-through the ones not applicable</i>) • Bi-Semester/Trimester/Semester+Summer Session/Annual/Bi-Annual (<i>tick one/strike-through the ones not applicable</i>)
11	Proposed Date of Commencement:
12	Mode of Study/Examination:
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) No
14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) No
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) No
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) No
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Yes
18	Minimum Entry Level:

	<ul style="list-style-type: none"> • Applicant must have 16 years of Economics / Finance / Banking /Accounting /Statistics /relevant education/ equivalent degree with 2.5/4 CGPA or 50% marks. • Students with non-business background will take deficiency courses as per HEC rules.
19	Admission Criteria: <ul style="list-style-type: none"> • The Application form duly filled and supported with relevant documents including attested copies of degrees/certificates, should be submitted to the University admission office. • Applicant must have clear GAT/GRE or Bahria University admission test.
20	Additional/Different Examination Requirement <i>(Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue).</i>
21	Number of Admissions Expected for First Intake: 15
22	Number of Admissions Planned/Expected for Subsequent Intakes: 15
23	Referred by: (delete which is inapplicable) FBOS: (Indicate the FBOS meeting reference and Item No) Competent Authority: (Indicate the File No & date; reproduce the decision)
24	Complete Plan of Studies, inclusive of complete Roadmap: (Attach as Annex 'A')
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (Attach as Annex 'B')

B. FINANCIAL DETAILS

1	Source of Funding:		
	<ul style="list-style-type: none"> • BU: Fully/Partially: • Public Sector (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • NNGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • INGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • UN/IGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) 		
2	Degree Duration:	Annual or Semester System:	
	1.5 Years	Semester:	Number of Semester (3)
	Total Number of Credit Hours: 30		
3	Expected fee to be charged based on Cost & Benefits Analysis: (show working)		
	Per annum fee: 180,000 per student		
4	Expected Number of students for 1st & 2nd Intakes:	15 + 15 =30	
5	Expected Earning from first two Intakes (B5): (Show working)	Rs/- 5,466,000	
6	Expected Earnings for the Next Five Years (B6): (show working)	Rs/- 13,764,000	
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working)		
	Non (The existing faculty and HR is sufficient)		
8	Cost of Additional Laboratory Equipment/Tools (B8): (show working)	None	
9	Cost of Additional Classrooms (B9): (Include furniture, technical aids etc)	None	
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details) (Attached as Annexure C)	Rs/- 300,000	
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details)	No	
12	Miscellaneous Expenses required for Starting the Program (B12):		
	<ul style="list-style-type: none"> - Advertisement: 200,000 - Printing & Stationery 100,000 - Admin Cost Nil - Any other - Total Rs/- 300,000 		
13	Annual Recurring Expenditures in Subsequent Years (B13):		
	<ul style="list-style-type: none"> - Salaries: - Rentals: - Subscriptions/Memberships: - Advertisements: - Printing & Stationery: - Admin Cost 		

	- Any other - Total:	Rs/- 300,000
14	Total Cost of the Programme (B14): [Add B(7) to B(12)]	Rs/- 600,000
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)]	Rs/- 600,000
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] 4,485,000 - 600,000 = Rs 3,885,000	
17	Projected Annual Gross Earning in Subsequent Years (B 17): (show details & working; add 10% towards all expenses in subsequent years.) (For Details See Annexure C) 6,690,000 +6,690,000 +6,690,000 +6,690,000	
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] 6,310,000 + 6,277,600 + 6,290,700 + 6,250,770	

Annexure B**INTRODUCTION**

The MS in Economics is designed to provide rigorous training in economic theory, its techniques and applications, and in quantitative research methods. This program provides the advanced knowledge and skills required for a career as a professional economist in public service or the private sector. The program offers compulsory courses in the core areas of microeconomics, macroeconomics and econometrics. Other courses called option courses are taught along with it. The option courses are designed to develop knowledge and understanding of theory, techniques and debates within specialist fields of economics. It trains and prepare the student to undertake research. The programme offers a range of advanced options courses in macroeconomics, microeconomics and econometrics covering recent developments in theory and analytical techniques. These includes Development economics, Fiscal and Monetary economics, Financial economics, International trade, Urban economics and Public economics.

The M.Phil Program at the Pakistan Institute of Development Economics (PIDE) has been developed to provide the necessary facilities for training economists in Pakistan. Given the asymmetrical situation whereby only a small percentage of the entire population has access to higher education, it is hoped that the M.Phil program at PIDE would be a step forward in a critical field of knowledge and expertise. This program is aimed at imparting a full range of knowledge, awareness and expertise in economics to meet the emerging challenges, as well as equipping students with the analytical tools necessary for policy-oriented research.

OBJECTIVES

There is an intense awakening that sound economic policies for any country require the services of highly trained economists, having analytical ability and problem solving skills. It is a well-recognized fact that application of new ideas and economic theory leads to create new knowledge; one of the main objectives and contribution of universities for which these institutions are meant for.

The MS in Economics will ensure development of the skills needed for variety of services in the education sector, international institutions and public sector. The program aims at to foster advanced education and training in Economics. It will eventually develop teamwork, experiential skills, research skills and ability to communicate effectively. This program will strategically train up ambassador learners to build knowledge, skills, competencies and experiences. This program will meet market demands and also enhance intellectual ability of students.

PROGRAM SCOPE

The Master in Economics is addressed to all those who want to become future leaders and professional in the education sector, international institutions and public sector. The program is designed for:

- In-career personnel as well as fresh university graduates who are keen to acquire critical knowledge and skills in areas related to Economics and finance.
- Managers and financial specialists in public and private organizations who wish to broaden the span of their knowledge and opportunities in the economy of Pakistan.

ELIGIBILITY CRITERIA

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- Applicant must have 16 years of Economics / Finance / Banking /Accounting /Statistics /relevant education/ equivalent degree with 2.5/4 CGPA or 50% marks
- Applicant must have clear GAT/GRE or Bahria University admission test.
- Students with non-business background will take deficiency courses as per HEC rules.

ROADMAP OF MS ECONOMICS

First Semester (12 Cr)

S.No.	Course Code	Course Titles	Level	Credit Hours
1	MSE- 701	Advance Micro-Economics	Core	3
2	MSE- 703	Applied Econometrics	Core	3
3	MSE- 704	Mathematical Methods for Economists	Core	3
4		Elective 1		3

Second Semester & Electives (12 Cr)

S.No.	Course Code	Course Titles	Level	Credit Hours
1	MSE- 702	Advance Macro-Economics	Core	3
2	MSE- 705	Developmental Economics: Theory and Policy	Core	3
3		Elective 2		3
4		Elective 3		3

Third Semester (6 Cr)

S.No.	Course Code	Course Titles	Level	Credit Hours
1	MSES RD-700	Thesis Write-up		6

Total Credit Hours: 30

Core: 15

Dissertation: 6

Electives: 9

List of Electives:

S.No.	Course Code	Course Titles	Concentration
1	MSE-711	Seminars in Applied Economics/ Applied Policy Analysis for Macroeconomic Development	Economics
2	MSE- 712	Financial Economics	Finance
3	MSE- 713	International Trade	Economics
4	MSE- 714	Fiscal Policy	Finance
5	MSE- 715	Monetary Policy	Finance

6	MSE- 716	Environmental and Natural Resource Economics	Economics
7	MSE- 717	Public Economics for Public Policy	Economics
8	MSE- 718	Industrial Economics	Economics
9	MSE- 719	Urban Economics	Economics
10	MSE- 720	Economic Appraisal and Valuation	Finance

Examination Policy:

Mid-terms;	25 Marks
Final terms;	40 Marks
Quizzes:	15marks
Assignments	20 Marks
Total	100 Marks

CORE COURSES DISCRIPTION, LEARNING OBJECTIVES, OUTLINE & REFERENCES**MSE-701 Advance Microeconomics****Description**

Microeconomics is the study of individual economic units and their rational behavior regarding optimal decision making in real life. The students in this course learn the concepts of optimal resource allocation as consumers, producers and managers of businesses. The students also learn pricing policy of the firms under various market situations of perfect and imperfect competition. Economic decision-making in the event of various government policies and government regulations regarding taxation and externalities is the special focus of this course on the application side.

Learning Objectives

This course is aimed at highlighting the use of micro economics in business decision. The main objective of the study of this course is to enhance the students' knowledge about:

- Optimal resources allocation: The resources of factors of production are always scarce and limited with the business firm. This course will enlighten how the productive resources are optimally allocated in the production of numerous goods and services.
- Optimal production decision: The business firm can produce goods with different alternative techniques. They have to continuously face the problem of the technique to be chosen. Because, the resources like labor, capital are limited. The course will examine the behaviors of individuals and firms in the market and the implications of their choices, using basic economic principles and tools.
- Pricing policy: The firms will have to face the problem of pricing their productions. The firm should be able to fix appropriate price to achieve its objectives. The course provides the basis for analyzing and solving the pricing problems.
- Business decision making: It contributes improved decision making in the areas of demand analysis, optimal production decision, pricing decision to maximize profit. It helps business man to determine the price of different goods and factors of production.

Outline

Consumer Theory

- Consumer preferences
- Utility Maximization
- Preferences ordering axioms
- Utility functions
- Utility Maximization and Comparative Statistics

- Marshallian Demand Functions
- Hicksian Demand Functions
- Duality – indirect utility functions
- Solution of dual problem
- Roy's identity
- Shepherd lemma
- Elasticity and its computation

Producer Theory

- Production Sets and Functions
- Isoquants and the Marginal Rate of Technological Substitution
- The Nature of Cost
- Long Run Cost Minimization and Long Run Cost Functions
- Short Run Cost Functions
- Duality between Cost and Production
- Long run profit maximization and Supply
- Short run profit maximization and Supply

Partial Competitive Equilibrium

- Market Demand
- Short Run Supply
- Equilibrium and Comparative Statics
- Long Run Competitive Equilibrium
- Ricardian Rent
- Welfare Analysis and its Applications

General Equilibrium

- Exchange - Edgeworth Box Representation - Pareto Optimality - Competitive Equilibrium - First and Second Welfare Theorems - The Core
- Production - Robinson Crusoe Economy - Production Feasible Sets and Production Possibility Frontier - Pareto Optimality and Competitive Equilibrium Revisited

Choice Under Uncertainty

- Objective Uncertainty - Objects of Choice and Preference Functionals - Axiomatic Characterization of Expected Utility - Arrow-Pratt characterization of comparative risk aversion - Rothschild-Stiglitz characterization of comparative risk aversion - Demand for Insurance
- Subjective Uncertainty - States, Events, Outcomes, and Acts - Probabilistic Sophistication - Expected Utility Preferences over subject acts - State Dependent Utility
- Evidence and Alternative Models - Evidence on the Independence Axiom (Allais Paradox) - Non-expected Utility Functionals - Evidence on Probabilistic Sophistication and the Stability of Preferences - Ellsberg Paradox and Ambiguity Aversion

Game Theory

- Basic concepts
- Prisoner's Dilemma
- Nash Equilibrium
- Strategies of game theory

Competitive Markets

- Short run and long run equilibrium
- Mathematical models of competitive markets
- Comparative analysis

Profit Maximization

- Nature of firms and profit maximization behavior
- Short run and long run behavior of profit maximization firms

Imperfect Market Structure

- Nature of Imperfect markets
- Profit maximization behavior of imperfect markets
- Price Discrimination

Asymmetric Information

- Principal Agent Model
- Moral Hazard types pricing behavior
- Market signaling

Textbook(s)/ Reference Book(s)

- Walter Nicholson, “ Intermediate microeconomics” 9th edition, South Western College Publishing, USA
- McConnell Brue, “ Microeconomics” 16th edition, Glencoe/McGraw-Hill
- Nicholson, and Snyder, Microeconomic Theory: Basic Principles and Extensions (10th Edition)
- Microeconomic Analysis, Hal Varian, Third Edition.

MSE-702 Advance Macroeconomics**Description**

The study of macroeconomics, having a significant impact on overall economy, plays a pivotal role in the development of a country. All main issues, which have either positive or negative impact on the society, would be under consideration in this course. All the developed countries have strong economies just because of effective Demand Management Policies. In this course we will cover various macroeconomic policies and their roles in economic stability, such as fiscal and monetary policy, trade policy and balance of payment policies, and international linkages with the rest of world. Further, we will also cover various behavioral aspects of macroeconomics such as inflation and unemployment and business cycles. Main objective of the proposed macroeconomics course is to equip the students with a solid knowledge, techniques of measurement and understanding of Macroeconomic issues.

Learning Objectives

On completion of the course, Student will have following general understanding such as:

- Basic concepts of macroeconomics
- Understanding various problems and performance of different sectors of the economy
- Multipliers and their economic applications
- The meaning of the business cycle and its phases
Basic Aggregate Supply, Aggregate Demand model of the macro economy
- Importance of Fiscal policy, its tools, and its advantages and drawbacks
- Analysis Monetary policy its tools, and its advantages and drawbacks
- International and trade Linkages
- Business Cycle Fluctuations
- Behavioral Aspects of Macroeconomics

Outline**Introduction**

- Classification of Economics
- Various aspects of Macroeconomics
- Measurement of structure of Economy

Multiplier and Mathematical Treatment

Types of Multiplier: Investment Multiplier, Government Multiplier, Tax Multiplier, Mathematical Derivation of different multipliers and their applications

Aggregate Demand and Aggregate Supply

Main Determinants of Aggregate Demand, Equilibrium in Money Market; Demand for Money and Supply of Money, General Equilibrium; Aggregate Demand and Aggregate Supply Equality

Consumption Basic Concept and identification of various components of Consumption, Derivation of APC and MPC. Short run and Long run behavior of consumption curves. Various theories of consumption and model regarding consumption behavior

Saving

Basic Concept and identification of various components of Saving, Derivation of APS and MPS. Short run and Long run behavior of saving curves. Relationship between income, consumption and saving

Investment

Expected rate of profits and investment, Marginal efficiency of capital, Present discounted value, and Investment demand function. Tobin's q theory. Analyzing Investment models in economy

Real Business Cycle

Features of Business Cycle, Business Cycle Theories, Internal and External mechanism. Demand induced cycles, Business Cycle and Aggregate Demand. Baseline RBC model and its application in Economics

Saving and Investment in Open Economy

- BOP accounting
- Goods Market equilibrium
- Money market equilibrium

Long Run Economic Growth

- Sources of economic growth
- Growth Dynamics: The Solow Model
- Policies regarding long run economic growth

IS LM Framework

Concept of IS and LM Framework, Derivation of IS and LM Curves, Shifting and various position of IS and LM curves.

Fiscal Policy

Tools of fiscal policy, Pros and Cons of Fiscal Policies, Keynesian View for preferences of Fiscal Policies. Effectiveness of Policy during IS LM framework in different scenario.

Monetary Policy

Tools of Monetary Policy, Application of various tools of monetary policy for economic stability. Effectiveness of monetary policy during IS LM framework in different scenario.

Demand of Money

Definition of Money, Evolution of money, Measurement of Money, Demand for money for transaction Purposes, Demand for money for speculative purpose, Money Demand Function

Money and Banking

Central Banking and Money Creation, Control of bank money through required reserve ratio, Process of money creation and commercial banks, Relationship between Central Bank and Commercial Banks

Inflation and Unemployment

Inflation and its Measurement Demand Pull Inflation and Cost Push Inflation, Tradeoff between Inflation and Unemployment, Philips Curve, Philips Curve in the Long Run

Trade Linkages

Foreign Trade and Economic Growth, Determinant of trade and net exports, Exchange rate and Open Economy, Flexible and Fixed Exchange Rate. Policy effectiveness.

Textbook(s)/ Reference Book(s)

- David Romer, (2012) Advanced Macroeconomics, 4th Edition.
- William H. Branson, "Macroeconomic Theory and Policy, 3rd Edition
- Abel, Andrew H. and Ben S. Bernanke (2004), "Principles of Macroeconomics", New York
- Dornbusch, R and S. Fischer, "Macroeconomics", 7th edition, New York, McGraw Hill.
- Froyen, R.T., "Macroeconomic Theories and Policies, 8th edition, New York, Macmillan Publishing Company.

MSE-703 Applied Econometrics

Description

Econometrics is an empirical application of various economics theories. The main objective of the course is to introduce the students about the basic econometrics techniques and to prepare them to do their own applied work. In this course, will cover univariate and multivariate regression analyses and various estimation problems, qualitative analysis and simultaneous equation system. We will also cover various econometric issues, such as autocorrelation, multicollinearity and heteroskedasticity and their proper remedial measures.

Learning Objectives

On completion of the course, Student will have following general understanding such as:

- To learn and develop the basic econometrics concepts, with special focus on inferences and application in business education
- Construction and estimation of regression equation and its interpretation
- Understanding about various econometric issues and their proper remedial measures
- Computer applications of relevant various softwares, like EXCEL, SPSS, STATA and EVIEWS
- Broad overview of the subject and its applications

Outline

Introduction

- What and Why is Econometrics?
- Methodology of Econometrics
- Various types of Econometrics

Structure of Economic Data

- Time Series data
- Cross Sectional data
- Panel data
- Data handling

Classical Linear Regression Model

- Nature of Simple Regression Analysis
- Regression versus Causation
- Regression versus Correlation
- Selected Examples/Exercise

Multiple Regression Analysis: Estimation

- Motivation for Multiple Regression Analysis
- Interpretation of Results
- Determination of R Square and Adjusted R Square
- Selected Examples/Exercise

Multiple Regression Analysis: Inferences

- Hypothesis Testing
- Establishment of confidence interval
- Testing of Individual coefficients
- Testing of overall model
- Selected Example/Exercise

Dummy Variable Regression Analysis

- Nature of Dummy Variable Regression Equation
- ANCOVA Models
- Selected Example/Exercise

Multicollinearity

- Multicollinearity and Its Consequences
- Detection of Multicollinearity

- Estimation in the presence of Multicollinearity

Heteroskedasticity

- Heteroskedasticity and Its Consequences
- Detection of Heteroskedasticity
- Estimation in the presence of Heteroskedasticity

Autocorrelation

- Autocorrelation and Its causes
- First and Higher order autocorrelation
- Detection and Resolving of Autocorrelation

NonLinear Regression Models

- Estimation of Linear and Nonlinear regression model
- Trial and Error Method
- Illustrative Examples

Qualitative Response Regression Models

- Nature of the Model
- Linear Probability Model (LPM)
- The Logit Model (Alternative to LPM)
- Illustrative Examples

Qualitative Response Regression Models

- The Probit Model and its Nature
- Probit Estimation with grouped data
- Tobit Model and Its estimation
- Illustrative Examples

Simultaneous Equation Models

- Nature of Simultaneous Equation
- Estimation the Equation
- Illustrative Examples

Time Series Econometrics

- ARCH Models
- GARCH Models
- Illustrative Examples

Time Series Econometrics

- VAR Models
- Causality Tests
- Cointegration and ECM
- Illustrative Examples

Panel Data Econometrics

- Traditional panel data models
- Advantages of panel data
- Fixed/Random effects models
- Illustrative Examples

Textbook(s)/ Reference Book(s)

- Basic Econometrics, Gujarati D.N. and Proter D.C. 5th Edition, 2009.
- Introductory Econometrics: A Modern Approach, Wooldridge J.M. 4th Edition, 2009.
- Applied Econometrics, Asterio D. and Hall S. 2nd Edition, 2011.

MSE-704 Mathematical and Statistical Methods for Economists

Description

The structure of the course includes advanced approaches of linear algebra, multivariable calculus, a general optimization problem of function of several variables both without restrictions and with

restrictions formed by equalities and inequalities. The course material should teach students to understand and prove the basic methods of linear algebra and calculus, and also to investigate the economic problems of comparative statics and optimization within the framework of advanced tools of mathematical models. The purpose of the course is not so much acquisition of new skills in a solution of mathematical problems relevant to economic applications, but study of methods of proofs and strict reviewing of some sections of mathematics.

Learning Objectives

On completion of the course, Student will have following general understanding such as:

- To learn and develop the basic mathematical concepts with proper use of those techniques and methods
- Solution and applications of mathematical tools in economics
- Solution of optimization problems
- Testing for equilibrium conditions
- Broad overview of the subject and its applications.

Outline

Introduction

- Nature of Mathematic Economics
- Mathematical versus Non-mathematical Economics
- Econometrics versus Mathematical Economics

Economic Models

- Nature of Mathematic and Economic Models
- Concepts of set theory and its applications
- Relation and Functions

Economic Models

- Types of Functions
- Constant and Polynomial Functions
- Nonalgebraic functions
- Functions with more than two variables
- Selected Examples/Exercise

Equilibrium Analysis in Economics

- Partial Market Equilibrium— A linear Model
- Partial Market Equilibrium— A Nonlinear Model
- Linear NonLinear functions
- Selected Examples/Exercise

General Market Equilibrium

- Two Commodity Market Model
- n-Commodity Model
- Selected Example/Exercise

Linear Models and Matrix Algebra

- Matrices and Vectors
- Matrix Operation
- Matrix laws
- Solution to Matrix
- Selected Example/Exercise

Linear Models and Matrix Algebra (continued)

- Testing for singularity of matrix
- Inverse of matrix
- Cramer's Rule
- Selected Applications

Comparative Statistics and Concept of Derivatives

- Nature of comparative statistic
- Derivatives and identification of slope
- Concept limit and its use
- Selected Applications

Comparative Statistic Analysis: General Function Model

- Differentials
- Total differentials
- Rules of differentials
- Selected applications

Optimization: Special case of Equilibrium

- Optimum values versus extreme values
- Relative maximum and minimum
- Second derivatives test
- Selected applications

Optimization with Equality Constraints

- Effects of constraints
- Finding the stationary values
- Utility maximization under constraint optimization
- Selected applications

Optimization with Equality Constraints (continued)

- Second order conditions
- Quasiconcavity and Quasiconvexity
- Constraint Optimization
- Selected applications

Non-linear Programming

- Nature of Nonlinear Programming
- Kuhn-Tucker conditions
- Economic Application

Non-linear Programming (continued)

- Constraint Qualifications
- Theorem in Nonlinear Programming
- Illustrative Examples

Optimization with Equality Constraints

- Extensive use of constraint optimization
- Homogeneous functions
- Least cost combination of inputs
- Illustrative Examples

Economic Dynamics and Integral Calculus

- Dynamics and Integrations
- Rules of Integrations
- Improper integrals
- Economic Applications of integrals
- Illustrative Examples

Textbook(s)/ Reference Book(s)

- A.C. Chiang and Kevine W. Fundamental Methods of Mathematical Economics, 4th edition, 2005.
- Mathematics for Economists, Carl Pearson and Lawrence Blume, latest edition.
- Mathematics for Economics, Michael et al., second edition.

MSE-705 Development Economics: Theory and Policy

Description

Topics include the structure of developing countries, their institutions, the policies their governments follow, the contours of poverty and inequality, and the ongoing struggles with economic growth. Apart from that it would cover theoretical foundations for different policy issues such as--What is the role of markets? Is government intervention in a market is a good thing? Do we need to be concerned about inequality? and why? What are institutions, and how do they facilitate or hinder economic development? Is development necessarily uneven, with some sectors growing and others stagnating? How do we think about the political economy of development: from voting or lobbying all the way to conflict? What are local problems and policies and what are international problems and policies?

Learning Objectives

Outcomes of the course: At the end of the course the student will be able to learn the structure of developing countries, their institutions, the policies their governments follow, the contours of poverty and inequality, and the ongoing struggles with economic growth. Apart from that it, the student would understand the theoretical foundations for different policy issues such as--What is the role of markets? Is government intervention in a market is a good thing? Do we need to be concerned about inequality? and why? What are institutions, and how do they facilitate or hinder economic development? Is development necessarily uneven, with some sectors growing and others stagnating? A student will also start thinking about the political economy of development, local problems and policies and international problems and policies?

Objectives of the course: The aim of this course is to introduce students to the central issues surrounding poverty and economic development. We begin with an overview of economic development and the model's economists use to understand the process of economic development. Next, we consider some of the impediments to development and how they can potentially be addressed. We also explore the constraints to growth in developing countries, focusing on how decision making and markets function under these constrained circumstances. We will also examine some of the main debates in designing development policy. In addition to conceptual knowledge, the course will also focus on building communication skills essential for a development economist..

Outline

Introducing Economic Development: A Global Perspective (Todaro Ch. 1, Ray Ch. 1)

How the Other Half Live; Economics and Development Studies; What Do We Mean by Development? The Millennium Development Goals; What is new in development Economics?; Sokoloff, K. and S. Engerman (2000), "History Lessons: Institutions, Factor Endowments, and Paths of Development in the New World," Journal of Economic Perspectives.

Comparative Economic Development (Todaro Ch. 2, Ray Ch. 1)

Defining the Developing World; Basic Indicators of Development: Real Income, Health, and Education; Holistic Measures of Living Levels and Capabilities; Characteristics of the Developing World: Diversity within Commonality; How Low-Income Countries Today Differ from Developed Countries in Their Earlier Stages; Are Living Standards of Developing and Developed Nations Converging? Long-Run Causes of Comparative Development; 7. Basu, K. Analytical Development Economics: The Less Developed Economy Revisited. (Cambridge: MIT Press); Thirlwall, A. P. Growth, and Development with Special Reference to Developing Economies. (Basingstoke: Palgrave Macmillan)

Classic Theories of Economic Growth and Development (Todaro Ch. 3, Ray Ch. 2)

Classic Theories of Economic Development: Four Approaches; Development as Growth and the Linear-Stages Theories; Structural-Change Models; The International-Dependence Revolution; The

Neoclassical Counterrevolution: Market Fundamentalism; Classic Theories of Development: Reconciling the Differences

Contemporary Models of Development and Underdevelopment (Todaro Ch. 4)

Underdevelopment as a Coordination Failure; Multiple Equilibria: A Diagrammatic Approach; Starting Economic Development: The Big Push; Further Problems of Multiple Equilibria; Michael Kremer's O-Ring Theory of Economic Development; Economic Development as Self-Discovery; The Hausmann-Rodrik-Velasco Growth Diagnostics Framework

Poverty, Inequality, and Development (Todaro Ch. 5, Ray Ch. 6, 7 & 8)

Measuring Inequality and Poverty; Poverty, Inequality, and Social Welfare; Absolute Poverty: Extent and Magnitude; Economic Characteristics of High-Poverty Groups; Policy Options on Income Inequality and Poverty: Some Basic Considerations; Ravallion, Martin. "On Multidimensional Indices of Poverty", Journal of Economic Inequality, vol. 9(2) (2011); Sala-i-Martin, Xavier. "The World Distribution of Income: Falling Poverty and...Convergence, Period", Quarterly Journal of Economics, vol. 121(2) (2006); Deaton, Angus. "Measuring Poverty in a Growing World (Or Measuring Growth in a Poor World)", Review of Economics and Statistics, vol. 87 (1) (2005)

Population Growth and Economic Development: Causes, Consequences, and Controversies

(Todaro Ch. 6, Ray Ch. 9) 6.1

The Basic Issue: Population Growth and the Quality of Life; Population Growth: Past, Present, and Future; The Demographic Transition; The Causes of High Fertility in Developing Countries: The Malthusian and Household Models; The Consequences of High Fertility: Some Conflicting Perspectives; Some Policy Approaches; K. Munshi and J. Myaux (2006), "Social Norms and the Fertility; Role of Human Capital in Development Transition," Journal of Development Economics; Bandiera, O. et. al, "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa", working paper (2014).

Urbanization and Rural-Urban Migration: Theory and Policy (Todaro Ch. 7, Ray Ch. 10)

The Migration and Urbanization Dilemma; The Role of Cities; The Urban Giantism Problem; The Urban Informal Sector; Migration and Development; Toward an Economic Theory of Rural-Urban Migration

Human Capital: Education and Health in Economic Development (Todaro Ch. 8, Ray Ch. 4 & 13)

The Central Roles of Education and Health; Investing in Education and Health: The Human Capital Approach; Child Labor; The Gender Gap: Discrimination in Education and Health; Educational Systems and Development; Health Measurement and Distribution; Disease Burden; Health, Productivity and Policy

Agricultural Transformation and Rural Development (Todaro Ch. 9, Ray Ch. 11)

The Imperative of Agricultural Progress and Rural Development; Agricultural Growth: Past Progress and Current Challenges; The Structure of Agrarian Systems in the Developing World; The Important Role of Women; The Microeconomics of Farmer Behavior and Agricultural Development; Core Requirements of a Strategy of Agricultural and Rural Development; Restuccia, Yang, Zhu, "Agriculture and Aggregate Productivity: A Quantitative Cross Country Analysis", Journal of Monetary Economics, 55(2), (2008)

The Environment and Development (Todaro Ch. 10)

Environment and Development: The Basic Issues; Rural Development and the Environment: A Tale of Two Villages; Global Warming and Climate Change: Scope, Mitigation, and Adaptation; Economic Models of Environment Issues; Urban Development and the Environment; The Local and Global Costs of Rain Forest Destruction; Policy Options in Developing and Developed Countries

Development Policymaking and the Roles of Market, State, and Civil Society (Todaro Ch. 11)

A Question of Balance; Development Planning: Concepts and Rationale; The Development Planning Process: Some Basic Models; Government Failure and the Resurgent Preference for Markets over Planning; The Market Economy; The Washington Consensus on the Role of the State in Development; Development Political Economy: Theories of Policy Formulation and Reform; Development Roles of NGOs and the Broader Citizen Sector; Trends in Governance and Reform

PROBLEMS AND POLICIES: INTERNATIONAL AND MACRO : International Trade Theory and Development Strategy (Todaro Ch. 12, Ray Ch. 16);

Economic Globalization: An Introduction 12.2 International Trade: Some Key Issues; The Traditional Theory of International Trade; The Critique of Traditional Free-Trade Theory in the Context of Developing-Country Experience; Traditional Trade Strategies for Development: Export Promotion versus Import Substitution; The Industrialization Strategy Approach to Export Policy; South-South Trade and Economic Integration; Trade Policies of Developed Countries: The Need for Reform and Resistance to New Protectionist Pressures

Balance of Payments, Debt, Financial Crises, and Stabilization Policies (Todaro Ch. 13)

International Finance and Investment: Key Issues; The Balance of Payments Account 13.3 The Issue of Payments Deficits; Accumulation of Debt and Emergence of the Debt Crisis; Attempts at Alleviation: Macroeconomic Instability, Classic IMF Stabilization Policies, and Their Critics; Odious Debt and Its Prevention; Resolution of 1980s–1990s Debt Crises and Continued Vulnerabilities; The Global Financial Crisis and the Developing Countries

Foreign Finance, Investment, and Aid: Controversies and Opportunities (Todaro Ch. 14)

The International Flow of Financial Resources; Private Foreign Direct Investment and the Multinational Corporation; The Role and Growth of Remittances; Foreign Aid: The Development Assistance Debate; Conflict and Development

Finance and Fiscal Policy for Development (Todaro Ch. 15, Ray Ch. 18)

The Role of the Financial System in Economic Development; The Role of Central Banks and Alternative Arrangements; Informal Finance and the Rise of Microfinance; Reforming Financial Systems; Fiscal Policy for Development; State-Owned Enterprises and Privatization; Public Administration: The Scarcest Resource

Group Presentations of Final Projects

Textbook(s)/ Reference Book(s)

- Todaro, M. P. and S. C. Smith. Economic Development, 11th edition (2011). Palgrave.
- Debraj Ray. Development Economics, (1998), Princeton University Press.
- Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty, by Abhijit Banerjee and Esther Duflo; Public Affairs, 2012.
- Reading Material: Sokoloff, K. and S. Engerman (2000), "History Lessons: Institutions, Factor Endowments, and Paths of Development in the New World," Journal of Economic Perspectives. 2. Acemoglu, D., Johnson, S. and J. Robinson (2001), "The Colonial Origins of Comparative Development: An Empirical Investigation," American Economic Review. 3. S. Anderson and D. Ray (2010), "Missing Women: Age and Disease," Review of Economic Studies. 4. J. Esteban, L. Mayoral and D. Ray (2012), "Ethnicity and Conflict: Theory and Facts," Science. 5. Acemoglu, Daron and James A. Robinson (2006), Economic Origins of Dictatorship and Democracy , Cambridge University Press; 6. Basu, K. Analytical Development Economics: The Less Developed Economy Revisited. (Cambridge: MIT Press) 8. Thirlwall, A. P. Growth, and Development with Special Reference to Developing Economies. (Basingstoke: Palgrave Macmillan)

MSESRD-700 Thesis Project

The project is to be undertaken by every student in the final semester. This will be research based under the supervision of an MS or Ph. D. Faculty member. The aim of the project is to help the student carry out genuine research and produce a project in the relevant field. The student will capitalize on the knowledge gained from her/his experience and education in previous semesters. Student will choose the research title and have it approved by the supervisor before embarking upon the research. The program leader will assign a supervisor. Upon completion of the project, students will be able to:

- Develop a clear understanding of the fundamental features of a particular topic in Islamic Finance;
- Be able to transform theory into practice by conducting empirical research; use the acquired knowledge to solve particular research problem in Islamic Finance;
- Develop a research problem that he or she may study further at the PhD level;
- Participate in the development of knowledge in Islamic Finance.

Though there is no formal class contact in this course, the student is expected to meet her/his supervisor at least once a week to discuss the progress of research and seek advice for further course of action.

ELECTIVES, LEARNING OBJECTIVES, OUTLINE & REFERENCES

MSE-711 Seminars in Applied Economics/Applied Policy Analysis for Macroeconomic Development

Description

This course explores the foundations of applied macroeconomic policy analysis by combining a rigorous introduction to advanced quantitative methods with applications to the theory and empirics of long-run growth in developing countries. Throughout the course, lectures provide analytical but non-technical overviews of broad themes in long-run growth and development policy, with a strong emphasis on how the body of knowledge has evolved over time via the synthesis of theoretical advances and rigorous empirical testing.

The course will primarily focus on building analytical skills to read, interpret, and critique econometric approaches to causal identification commonly used in the academic development literature. The emphasis will be on developing rigorous intuition rather than technical details; The focus will be on high-level applied research in a sophisticated manner. The seminars in the term give students an opportunity to repeatedly practice and improve their skills by working through problem sets based on top academic journal articles addressing issues from the lectures on macroeconomic development.

Learning Objectives

On completion of the course, Student will have following general understanding such as:

- Growth theory
- Institutions and history
- Globalization,
- Balance of payments
- Financial crises
- Environmental policy
- International finance

Outline

Growth theory

- Sources of economic growth
- Growth Dynamics: The Solow Model

- Policies regarding long run economic growth and Application of growth theory in economics

Institutions and history

- United nation
- World bank
- International Monetary fund
- Regional institutions as Asia Development Bank, International Financial institutions and others

Globalization

- Advantages and disadvantages of globalization
- Effects of labor market, financial markets and economic growth
- Cultural globalization
- Economic globalization
- Geographical globalization
- Institutional globalization
- Political globalization
- Seminar on Globalization

Balance of payments, Exports & Imports, and Terms of trade

Exchange rate and balance of payments

- Measurement of balance of payments
- Financial crises
- History of various nations
- Solutions of coping with the Financial crises

International finance

- Currency Derivatives
- Futures and Options
- International Arbitrage and Interest Rate Parity

Environmental policy

- International environmental problems
- Game Theory
- International Cooperation

Seminar in International Policy/ Environmental Policy

Textbook(s)/ Reference Book(s)

- Froyen, R.T., " Macroeconomic Theories and Policies, 8th edition, New York, Macmillan Publishing Company
- John A. Hobson, (2003) International Trade: An Application of Economic Theory
- Kolstad, Charles. *Environmental Economics*. 2nd ed. Oxford University Press, 2010. L
- Various journal articles.

MSE-712 Financial Economics

Description

Financial Economics provides students with an in-depth introduction to the theories of asset pricing and corporate finance. The course analyses investors' behaviour, market equilibrium, the pricing of securities, the valuation of real assets, and capital structure choice. Topics in asset pricing will encompass portfolio choice, complete and incomplete markets, mean-variance portfolio theory and equilibrium asset pricing, pricing with no arbitrage, Black-Scholes and other contingent claims pricing models, and the behaviour of financial markets during crises. Topics in corporate finance will

encompass valuation methods and financing decisions in the presence of taxation, agency frictions, and asymmetric information.

Learning Objectives

- Students will acquire quantitative and structural views of the variety of new financial instruments and of risk management frameworks that are practiced in our modern financial markets.
- Students will learn how to price securities and the valuation of real assets
- They will learn how to access credit market and operational risk
- They will learn about how financial markets behave during crisis

Outline

Introduction

- Financial centers and their role
- Money markets, capital markets and the banking system
- Services of a financial center
- The globalization of financial markets
- Technology Deregulation
- Financial innovation and their types
- Emerging markets and problems concerning

Financial Risk: Market Risk Market

- Risk of Stocks and Stock Portfolio.
- Market risk for interest rates.
- Portfolio diversification.
- Systematic Risk and specific risk (to be diversified)
- Value at Risk
- Short fall and regulatory required capital Risk hedging with Futures and Options

Financial Risk: Credit Risk

- Probability of default and credit rankings
- Merton Model.
- Credit risk in Bonds and Bank loans.
- Statistical approaches to measure the credit risk (probability of default)
- Hedge with derivatives (Credit default swaps)

Financial Risk: Operational risk

- Business line and units.
- Statistical approaches to measure the operational risk
- Regulatory capitals required for each financial risks.

Portfolio: Optimizations

- Brief view to Mean variance approach
- Portfolio and its market risk (VaR and ShortFall)
- Briefly introduction to CAPM (Capital Asset Pricing Model)

Portfolio: Bond portfolio

- Interest rates and yield curve
- Credit and credit transform
- Bond portfolio and Loan portfolio with their current value and those of one year later
- Regulatory Capital Requirements
- Interest rates swaps

Securitization

- Securitization scheme (CDO) and its merit under regulations
- Hedge with Credit default swap (CDS).

Financial Crisis (Subprime Home Loans)

- Originate-to- Distribute business model

- Traditional securitization
- Twice-securitized security(CDO square)
- Synthetic CDO.

Capital Asset Pricing Model

- The market model
- Portfolio risk and return using the market model
- The capital asset pricing model
- Assumptions and theory
- The securities market line
- Measuring the beta coefficients
- Empirical testing of the CAPM
- The multifactor CAPM
- Critique of the CAPM

Capital Asset Pricing Model

- CAPM (Capital Asset Pricing Model) and Beta.
- APT (Arbitrage Pricing Theory) and Multi-factor model.
- Fama and French Model.
- Derivative Pricing Theory and Real Markets
- Do the basic models in Theory really fit to the reality of Markets?
- How do we use Theory in Practice?

Option Pricing

- Further details for Call and Put Options.
- Put-Call parity.
- Black-Scholes Pricing Formula and Replication of options.
- Portfolio Insurance and Black Monday on year 1987.

More on Options

- Option types:
- European and American.
- Path-dependent and independent.
- Barrier Options and other Exotic derivatives.
- Derivatives on Exotic underlying variables: weather derivatives.

Derivatives: More on Swaps

- Role of Interest rate Swaps.
- Swap rates and swap spreads.
- Counter party risk with credit risk.
- Cap and Caplets Floor and Floorlets.

Derivatives: Innovations

- Structural Bonds: Derivatives imbedded in Coupons of Bonds.
- CoCo Bonds (Contingent Convertible Bond) and Systemic Risk

Textbook(s)/ Reference Book(s)

- [The Essentials of Risk Managements. 2nd edition] by Michel Crouhy, Dan Galai and Robert Mark (McGraw Hill Education 2014) for risk management.
- [RISK Management] by M. Crouhy, D. Galai and R. Mark (McGraw Hill 2001) for more technical and/or engineering aspects

MSE-713 International Trade

Description

A graduate course in international trade economics consisting of

- i) The fundamentals of trade theory and its application to policy and
- ii) International macroeconomics.

The study of international trade economics, having a significant impact on overall economic trade, plays a pivotal role in the development of a country's import and exports. All main issues, which have either positive or negative impact on the international trade, would be under consideration in this course.

Learning Objectives

On completion of the course, Student will have following general understanding such as:

- Basic concepts of Trade Economics. Comparative advantage and the gains from trade. Theories of comparative advantage.
- Intertemporal trade and the current account balance. Dynamics of small open economies.
- Factor endowments, the international location of production, and patterns of international trade. Empirical tests of trade models.
- Trade and the labor market. Intra-industry trade.
- Firm heterogeneity and selection into trade.
- General equilibrium trade policy.
- International and trade Linkages
- Foreign direct investment. International macroeconomics
- The real exchange rate and the terms of trade
- Uncertainty and international financial markets.
- Monetary model of exchange rate determination: flexible and sticky prices.
- Introduction to currency crises models.

Outline

Introduction

- Trade: Comparative advantage and the gains from trade.
- Theories of comparative advantage.

Trade Factors

- Factor endowments
- The international location of production
- Patterns of international trade

Trade Models

- Empirical tests of trade models.
- Trade and the labor market.
- Intra-industry trade
- Firm heterogeneity
- Selection of firms into trade.

International macroeconomics:

- Intertemporal trade and the current account balance.

General equilibrium trade policy.

- Dynamics of small open economies.
- Uncertainty and international financial markets.
 - Monetary model of exchange rate determination:
 - Flexible and sticky prices.
- The real exchange rate and the terms of trade.
 - Trade policies and their effectiveness in economy

Trade Linkages

- Foreign Trade and Economic Growth, Determinant of trade and net exports,

Trade Linkages

- Exchange rate and Open Economy
- Flexible and Fixed Exchange Rate. Policy effectiveness.

Introduction to currency crises models.

- Increasing interest rate: moral hazard and adverse selection occur

- Rising uncertainty: interest rates rise
- Falling asset prices: lower stock prices or real asset prices lowers a firm's NW
- Deflation: increases the real debt burden and reduces future cash flow: NW decreases
- Bank run - increase in interest rate - lower availability of funds - increase in uncertainty - decrease in firm's NW.

Textbook(s)/ Reference Book(s)

- John A. Hobson, (2003) International Trade: An Application of Economic Theory
- Karya Umam," Basica of International Economics

MSE- 714 Fiscal Economics

The course examines contemporary issues in fiscal governance in OECD countries and elsewhere. This course aims at providing an overview of the key fiscal policy concepts and techniques used to analyze how fiscal policy can help ensure macroeconomic stability and sustainable long-term growth. This course is built around core macro-fiscal topics needed to analyze fiscal policy. It will discuss the role of fiscal policy in attaining the key objectives of the government: macro-stability, equity and efficiency, and sustainable long-term growth. It will help use the tools and techniques to assess the fiscal stance, fiscal multipliers, and debt sustainability. The key elements of tax and expenditure policy: concepts and best practices will also be reviewed in this course.

MSE-715 Monetary Economics**Description**

This course is designed as a survey of the basic theories in monetary economics for master level students. It will require strong knowledge of mathematics. The course aims to discuss and answer five questions: (i) How can central banks control inflation? (ii) How can we measure agents' inflation expectations? (iii) Can central banks become insolvent and how can they help during a fiscal crisis? (iv) How does monetary policy affect unemployment and real activity? (v) Why is central bank transparency important and how can policymakers use communication to steer the economy?

Core Courses MSE- 702 & MSE-701 are Prerequisites for this Elective.

Learning Objectives

- Help students understand the core aspects of monetary economy
- Understand how monetary phenomena and policies are determined
- Understand how do they interact with the rest of the macro economy
- Learning how to construct theoretical frameworks
- Analysis of monetary policy actions will be analyzed within such frameworks.
- Examine the financial crisis

Outline**Introduction to Monetary Economics**

- Introduction
- Basic Long and Short Run Correlations
- Estimating the effect of money on output

Money in the Long Run and General Equilibrium Models of Monetary Economy 1

- Solow growth Model
- Tobin's Monetary Growth Model

Money in the Long Run and General Equilibrium Models of Monetary Economy 2

- The Basic Money-in-the-Utility Model
- Steady State Equilibrium
- Dynamics in an MIU Model

Money and Public Finance

- Budget Accounting
- Inter-temporal Budget Balance
- Money and Fiscal Policy Frameworks
- Deficits and Inflation
- Cagans Model on dynamics of money and prices during hyperinflation
- Partial Equilibrium Model
- Optimal Inflation revenue and Temporary Shocks

Money in the Short Run: Short Run Models and Monetary Policy Transmission Mechanism

- Static AD-AS Model
- Phillips Curve

Money in the Short Run: Short Run Models and Monetary Policy Transmission Mechanism

- Rational Expectations and Stochastic Static AD-AS model with Rational Expectations
- Extension of the Basic Rational Expectations AD-AS Model: Persistent Effects of Monetary Policy on Output and Price
- New Keynesian Synthesis

Monetary Policy Transmission Mechanism and Credit Channel of Monetary Policy

- Financial Frictions in Credit Markets
- Adverse Selection
- Moral Hazard
- Monitoring Costs
- Agency Costs

Revision for Exam

Mid Term Exam (Subject to Change)

Monetary Policy Operating Procedures

- The Instrument Choice Problem – Operating Procedures and Policy Measures
- History of Fed Operating Procedures
- Profit maximization and the competitive firms
- The supply curve in Competitive market

Term Structure of Interest Rates

- The Expectations Theory of the Term Structure
- Policy and the Term Structure
- Expected Inflation and the Term Structure
- Application: Tax cut effects on bond interest rates

Optimal Monetary Policy Rules (1)

- Developing a basic model – using the MIU model
- Understanding the linearized new Keynesian model
- Monetary policy analysis in the new Keynesian models

Optimal Monetary Policy Rules (2)

- Developing a basic model – using the MIU model
- Understanding the linearized new Keynesian model
- Monetary policy analysis in the new Keynesian models

Financial Crisis and Monetary Policy

- Review the following articles in class
- Adrian, Tobias and Hyun Song Shin (2008), Financial Intermediaries, Financial Stability and Monetary Policy
- Bernanke, Ben (2009), Reflections on a Year of Crisis, Remarks made at the FRB of Kansas City's Annual Economic Symposium, Jackson Hole, Wyoming
- Brunnermeier, Marcus (2009), Deciphering the 2007-2008 Liquidity and Credit Crunch, Journal of Economic Perspectives

Monetary policy, Asset prices, and Financial Market.

- Ben S. Bernanke (2002), Asset-Price Bubbles and Monetary Policy, FRB, Remarks before the New York Chapter of the National Association for Business Economics, New York, New York; October 15, 2002.
- BS Bernanke and Mark Gertler (2001), Should Central Banks Respond to Movements in Asset Prices, American Economic Review
- Borio, Claudio and Philip Lowe, 2002, Asset Prices and Financial and Monetary Stability: Exploring the Nexus, BIS

Textbook(s)/ Reference Book(s)

- B. McCallum (1989), Monetary Economics, Macmillan
- L. Ritter, W. Silber & G. Udell (2000), Principles of Money, Banking and Financial Markets, Addison-Wesley, Tenth edition.
- K. Bain & P. Howells (2003), Monetary Economics: Policy and its Theoretical Basis, Palgrave Macmillan.
- M. Lewis & P. Mizen (2000), Monetary Economics, Oxford University Press.
- P. Bofinger (2001), Monetary Policy: Goals, Institutions, Strategies and Instruments, Oxford University Press.
- A. Blinder (1999), Central Banking in Theory and Practice, MIT Press.

MSE-716 Environmental and Resource Economics**Description**

This is a secondary-level course in environmental and resource economics. It is designed for graduates who want to study environmental and resource concerns with an interdisciplinary focus. More specifically, the course attempts to incorporate basic principles of both microeconomics and ecology that are essential for a comprehensive understanding and critical assessment of the human's historical struggles to "coexist" with the natural environment. These ecological and economic principles are also used to shed light on some contemporary and controversial environmental policy issues.

Right from the outset it should be understood that this course is not aimed at a study of a specific environmental issue. Instead, the course intends to delve into the theoretical underpinnings that are critical to a clear understanding of most contemporary environmental and natural resource problems. Thus, the emphasis is on a systematic development of theoretical principles and conceptual frameworks essential for a comprehensive analysis of environmental and natural resource issues and the assessments of alternative environmental policy instruments, in general.

Learning Objectives

- After following this course, students are able to describe the most important interactions between the economy and the environment, and their relationship with sustainable development.
- They will be able to explain why, and under which conditions, the free market does not result in an efficient outcome.
- They will be capable of showing how externalities can be 'internalized' by using market instruments, like taxes, quotas and tradable permits, etc.
- They will be able to evaluate and advise environmental policy makers on which policy instruments to use under different circumstances.

Outline

Introduction to natural resource Economics

The origin of the sustainability Problem;

- Basis of environmental science
- Environmental Pollution & Technology
- Human economic development
- Concepts of sustainability

- Hartwick Rule
- Incentives of Sustainability

Welfare economics and the environment:

- Efficiency and optimality
- An efficient allocation
- Market failure

Pollution control: targets & Instruments:

- Concept of a pollution
- Alternative policy for Pollution targets
- Flow and stock pollutants
- The role of spatial differentiation for emissions targets

Pollution policy with imperfect information

Economy-wide modelling:

- Input-output Analysis
- computable general equilibrium (CGE) models and their application

International environmental problems

- Game Theory
- International Cooperation

Cost–benefit analysis.

Valuing the environment

- Categories of economic value assigned
- Use and non-use values
- The utility theory
- Travel Cost Method

The efficient and optimal use of natural resources

- Concepts of efficiency and optimality
- Optimal growth Models

The theory of optimal resource extraction: non-renewable resources

- Resource substitution possibilities
- Models of optimal resource depletion.
- Dynamic analysis of resource depletion models
- Consequences of taxes and
• subsidies

Stock pollution problems:

- Models of optimal emissions
- Aggregate stock pollution model
- Model of waste accumulation

Renewable resources:

- Biological growth function
- sustainable yield
- Bio-economic equilibrium outcome
- Comparative statics analysis

Textbook(s)/ Reference Book(s)

- Ecological Economics, Principles and Applications, by Herman. E. Daly and Joshua Farley
- Economics, An Introduction, by Barry C. Field & Martha K. Field
- Environmental Economics of Natural Recourses and the Environmental by David W. Pearce & R. Kerry Turner
- Kolstad, Charles. *Environmental Economics*. 2nd ed. Oxford University Press, 2010.

Research Articles from Journals indexed by Thomson Reuters.

Research Articles from News Paper

MSE-717 Public Economics for Public Policy

Description

This course studies the economic role that governments play in a modern day economy and examines the theory and practice of government intervention in the economy. The topics include externalities and public goods as forms of market failure and the role of government in these contexts; theory of taxation and tax policies in Pakistan; social insurance and public sector expenditure program.

Learning Objectives

This course is aimed at highlighting the use of Public Economics in Public decision. The main objective of the study of this course is to enhance the students' knowledge about:

- To develop an understanding among students for the rationale of government intervention in a market economy; in particular explain market failure and income distributions as reasons for government intervention.
- To introduce students to externalities as a form of market failure; explain the Coase theorem and develop market and non- market solutions to the problem of externalities; familiarize students to global warming and acid rain as important forms of externalities and the suggested solutions for dealing with these externalities.
- To explain the concept of public good, the free- rider problem and why public goods are under-provided in a market economy; conditions under which private provision can overcome the free rider problem; public provision of public goods and issues related to public provision such as measurement (cost and benefit) and social choice.
- To elaborate on measurement issues related to the cost and benefits of public projects, in particular issues related to valuation of time and life.
- To develop the tools for political economy or how the government makes public policy decisions.
- In particular examine unanimous consent and majority voting as tools for decision making and outline Arrow's impossibility theorem; and also discuss the theory of median voter.
- To address the issue of fiscal federalism and the experiences and prospects of fiscal decentralization in Pakistan.
- To explain the theory of tax incidence and tax inefficiency; the theory of optimal commodity taxation and the theory of and evidence on (i) taxes on labour, (ii) taxes on savings, (iii) taxes on risk taking and wealth, and (iv) taxes on corporations.
- To introduce students to the major types of taxes levied by the federal, provincial and local governments in Pakistan.
- To develop an understanding among students of market failure in insurance market and related issues of adverse selection and moral hazard.
- To make students aware of the major types of public expenditure program in Pakistan, in particular education, health and poverty alleviation programs; also introduce students to some of the alternative approaches to the provision of these public sector programs.
- To prepare students to critically evaluate the consumption and income taxes in Pakistan, and the public sector expenditure programs.
- To present students with examples of public sector expenditure programs in the context of developing countries and to aid their understanding in applying the theory taught.

Outline

Overview;

- role of the State.
- The public sector in Pakistan.
- Economic rationale for government: market failure
- Economic rationale for government: distribution of income

Externalities and Public Goods

- Externalities
- Public Goods: Basic Theory

Public Goods

- Public Goods :Measuring cost and benefits of public provision of public goods

Public Goods

- Public Goods: Political economy issues

Introduction to Taxation:

- the forms of taxation;
- measuring fairness of tax systems;

Tax Bases;

- tax deduction,
- Tax credits and tax expenditures.
- Taxation and economic efficiency

Optimal taxation & Taxes on Labor Supply

- Optimal taxation
- Taxes on Labor Supply

Taxes on Savings & Taxes on Risk Taking and Wealth

- Taxes on Savings
- Taxes on Risk Taking and Wealth

Corporate Taxation & Taxes on Consumption and Sales

- Corporate Taxation
- Taxes on Consumption and Sales

Education:

- Motivation for government involvement,
- Measuring returns to education and the role of the government.

Social Insurance:

- The function of the government in the insurance market;
- social vs private insurance and problems with insurance

Education & Social Insurance:

- Empirical applications and examples from developing countries.

Social Security:

- Basic Theory and Reform
- Unemployment Insurance,
- Disability Insurance,
- and Workers' Compensation

Social Security & Unemployment Insurance: empirical applications and examples from developing countries

Health Insurance:

- Health Economics & Private Health Insurance

Income Distribution

- Income distribution and Welfare Programs

Income Distribution and Welfare Programs:

- Empirical applications and examples from developing countries

Fiscal Federalism

Textbook(s)/ Reference Book(s)

- Jonathan Gruber; Public Finance and Public Policy, third edition; Worth Publishers, 2009
- Other relevant textbooks are:
- Joseph E. Stiglitz; Economics of the Public Sector, third edition; W.W. Norton and Company, New York, 2000
- Jean Hindriks and Gareth D. Myles, Intermediate Public Economics; The MIT Press, 2006.

MSE-718 Industrial Economics**Description**

Industrial Economics is concerned with the strategic decisions taken by firms in markets, in particular when they have market power. First, to understand firm behavior when they have market power, the course will introduce the classical models of imperfect competition in markets. Then, we will cover sources of market power, such as product differentiation, advertising and consumer inertia. We will then explore more sophisticated pricing strategies, such as personalized and group pricing, menu pricing, bundling and the pricing of durable goods. Aside from optimal firm strategy, we will also discuss the welfare consequences of market power in markets, its antitrust implications, and the role that the state should take in regulating markets. Finally, we will discuss mergers and acquisitions, the boundaries of the firm (make or buy) and the optimal incentive provision through relational contracts, i. e., incentives in work or trade relationships that are not provided by formal contracts, but by reputational concerns that arise due to the long-lived nature of the relationship. For all these topics, the course will be split in lectures as well as exercises in order to rehearse and practice the course content. Basic Microeconomics concepts are more utilized in industrial economics. We will discuss all these issues in this subject in details.

Learning Objectives

Expected outcomes: The course requires sound knowledge of microeconomics at the graduate level. At the end of the course the student will be able to understand firm behavior, market power, classical models of imperfect competition, product differentiation, advertising and consumer inertia, pricing strategies, bundling and the pricing of durable goods. In addition, he will understand optimal firm strategy, welfare consequences of market power in markets, its antitrust implications, and the role that the state should take in regulating markets. Next he will learn about mergers and acquisitions, the boundaries of the firm (make or buy) and the optimal incentive provision through relational contracts.,

Objectives of the course: The course analyzes the problems of the real economy that cannot be described within the framework of a classical economic theory that is taught by traditional micro- and macroeconomics. This course will cover all the main fields of industrial organization theory: the theory of a firm, the theory of imperfect competition, and the theory of economic regulation. The students are presumed to be familiar with the standard courses in micro- and macroeconomics at the graduate level.

Outline**Introduction to Industrial economics**

Definition, classification of Economics, Industrial Economics and Economic Theory, Brief Review of important economic terms and concepts

Theory of a firm: What is the firm and why is it organized? A firm as an alternative to a market. Transaction costs theory explaining appearance of firms. Production scale, specialization level and advantages of firms as a means of production. Hierarchical firm structure and its efficiency. Optimal size of a firm (of a number of hierarchical levels). Hierarchical firm structure under oligopoly.

Consumer Surplus and Public Welfare: Estimation of public welfare within the framework of partial equilibrium analysis. Quasilinear utility function and measure of public welfare. Compensated and equivalent variations. Public welfare and Hicksian and Marshallian demand functions. Consumer surplus as an approximate measure of public welfare.

Economic Theory of Bundling: Bundling as a marketing tactics. Price discrimination and bundling. Heterogeneous consumers. Pure components strategy, pure bundling strategy, and mixed bundling strategy. Superiority of mixed bundling relative to pure bundling. Conditions for mixed bundling strategy to be dominant over pure components strategy. Independent distribution of reservation prices. Homogeneous consumers. Commodity bundling and consumer surplus.

Mergers and Acquisitions.

Horizontal Mergers and Acquisitions: Types of mergers and acquisitions: horizontal, vertical, conglomerates. Examples of mergers and acquisitions within the last decade. Mergers of firms with

identical production costs. Condition of a merger profitability. Mergers of firms with differing production costs. Reaction of a firm to a change in output by all other firms on the same market. Condition of industry output increase, resulting from a merger. Horizontal mergers and public welfare. Herfindal-Hirshman index as a measure of public welfare. Condition under which horizontal merger results in higher public welfare.

Vertical Mergers: Effect of a vertical merger on output of final and intermediate products. Vertical mergers and market foreclosure. Vertical mergers and profits of integrated and un-integrated firms.

Product Differentiation: Location Models Linear city, linear transportation costs. Quadratic transportation costs. Stability of equilibrium states. Circular city. Welfare implications.

Differentiated Goods: Increasing Returns to Scale, and Monopolistic Competition Markets for differentiated goods. The problems solved by consumers and producers. Market equilibrium under free entry conditions. Effects of fixed costs and market size on product diversity and output.

Industrial Agglomeration: Phenomenon of industrial agglomeration. Increasing returns to scale as a driving force of agglomeration. External and internal mechanisms of increasing returns to scale. The role of transportation costs. A simple model of industrial agglomeration: two regions, two production factors (perfectly mobile workers and immobile farmers). Competition and market size – the main factors affecting the process of industrial agglomeration. Effects of transportation costs, fixed costs, a share of immobile factor on industrial agglomeration. Stability of distributed and agglomerated equilibria. Multiple equilibria and hysteresis.

Economics of Innovations: Model of the innovation process. Patent race. Market structure and innovation efforts. Incentives for innovations. Socially optimal and market investments into R&D. Patent life.

Imperfect Competition and Macroeconomics: Theories of business cycles. Increasing returns to scale and stability of economic equilibrium. Price rigidity as a source of business cycles. Explanations of price rigidities: kinked demand curve, menu costs. Market monopolization and price rigidity. Small menu costs and large business cycles during economic booms and busts. Externalities, corrective taxes, and market structure. Possibility of a negative effect of Pigou tax on public welfare under monopoly.

Theory of Regulation: Public costs of monopoly. Subadditivity of cost function – a necessary and sufficient condition for a natural monopoly. Economy of scale, concavity of a cost function and subadditivity. Stability of a natural monopoly. History of regulation after World War II. When should natural monopolies be regulated? Demsetz competition for a market. Contestability of a market. Deadweight losses, sunk costs and regulation. Regulation under complete information. Price discrimination and nonlinear tariffs as a means of increasing efficiency of a regulated monopoly. Peak-load pricing. Regulating monopoly under asymmetric information. Exogenous mechanisms of 100 regulation. Averch-Johnson model. Endogenous mechanisms of regulation. The delegation and revelation approaches.

Analysis of Particular Industries and Enterprises: Airlines

Effects of deregulating air companies. “Hub and Spokes” system and its efficiency.

Theatres and restaurants: Why in developed market economies there are queues in theatres, restaurants, etc.? Network externalities in services consumption and non-monotonicity of demand function. Instability of equilibrium, corresponding to profit maximization, and limitedness of prices and supply of services.

Economics of Show Business:

Why relatively small number of people in show business, sports, book publishing, etc. earn a lot of money and dominate on markets? Effect of imperfect substitution: lesser talent is a poor substitute of larger talent. Dependence of demand function on quality. Increasing returns to scale in show business production. Demand and supply structure. Market equilibrium. Convexity of revenue function, depending on talent. Continuous distribution of performers on talent, and rent dissipation. Outstanding performer and rent value.

Textbook(s)/ Reference Book(s)

- Baumol W.J., J.C. Panzar, and R.D. Willig, 1982, Contestable Markets and the Theory of Industry Structure, New York: Harcourt Brace Jovanovich.
- Braeutigam R., 1989, Optimal Policies for Natural Monopolies, in R. Schmalensee and R.D. Willig eds.: The Handbook of Industrial Organization, Elsevier North-Holland. 101
- Farrel J., and C. Shapiro, 1990, Horizontal Mergers: An Equilibrium Analysis, American Economic Review, vol. 80, 107-126.
- Adams W.J., and J.L. Yellen, 1976, "Commodity Bundling and the Burden of Monopoly", The Handbook of Industrial Organization, Elsevier North-Holland.

MSE-719 Urban Economics**Description**

This is a secondary-level course in Urban Economics. The critical analysis of the economics of cities and urban regions will be discussed in detail. This course covers a wide range of theoretical approaches and policy options such as the existence and growth of cities, land use theories, urban transportation, pollution, poverty, crime, and housing.

After reviewing various economic theories that are aimed at explaining spatial aspects of the economy, this course will focus on the policies, which were developed to solve urban problems. The main emphasis will be to develop, critical review with respect to the efficiency and deficiency of policy instruments such as taxes and subsidies, command and control policies, zoning, or policing, will be discussed in detail. Each option will be considered and discussed by means of concrete examples.

Learning Objectives

- After following this course, students are able to describe the most important interactions between the economy and urbanization, and their relationship with sustainable development.
- They will be able to explain why, and under which conditions, the free market does not result in an efficient outcome.
- They will be capable of showing how urbanization can be optimized by using market instruments, like taxes, quotas and urban planning , etc.
- They will be able to evaluate and advise policy makers on which policy instruments be used under different circumstances

Outline**Introduction to Urban Economics**

- Market Forces in Development of Cities
- why do cities exist?
- what determines size
- what causes growth/decline
- impact of local government?

Firm Clusters and City sizes

- Sharing pooling and matching
- Utility & city size
- System of cities

Urban Growth

- Economic growth
- The urban labor market
- Public policy and equilibrium employment

Land Use

- Determinants of land prices.
- Why segregation by income within cities?
- From monocentric to disperse cities.

- Reasons for and impact of zonings

Urban Transportation

- congestion and policy options
- deficit of transit authorities
- efficiency of bus vs. train system (rail/subway)
- light rail systems
- parking

Urban Problems and Public Policy

- why highest poverty rates in central cities?
- is fact that poor together deteriorating?
- why is educational achievement so low in certain neighborhoods?
- economics of crime (effectiveness of punishment etc)
- why higher crime rates in central cities?

Housing and Public Policy

- what makes housing different from other goods?
- why do poor rent and don't own??
- market effects of housing policies
- causes of homelessness

Role of Local Government

- pros and cons of fragmented system of local gov's within met area
- is majority voting system efficient? (median voter model)

Local Government Expenditures and Taxes

- is the local property tax regressive or progressive?
- response to grants from state or national gov's (matching, non-matching)
- determinants of urban expenditure (sports, culture)

Textbook(s)/ Reference Book(s)

- O'Sullivan, A. (2008), Urban Economics, 7th ed., New York: McGraw-Hill
- Balchin, P., Isaac, D. and Chen, J. (2000), Urban economics – a global perspective. New York: Palgrave.
- Levy, J. (1985), Urban and metropolitan economics. New York: McGraw-Hill.
- Newman, P. and Kenworthy, J. (1999), Sustainability and cities. Overcoming automobile dependence. Washington D.C.: Island Press
- Glaeser, E. and Kohlhase, J. (2003), Cities, regions and the decline of transportation costs. NBER Working Paper No.9886. Cambridge, Mass.
- Storchmann, K. (2005), Externalities by automobiles and fare free transit in Germany. A paradigm shift? Journal of Public Transportation 6(4), 89-105.
- Storchmann, K. (2001), The impact of fuel taxes on public transport. Transport Policy 8, 19-28.

Research Articles from Journals indexed by Thomson Reuters.

Research Articles from News Paper

MSE-720 Economic Evaluation and Appraisal of Projects

Description

This course is about financial and economic appraisal of projects. The project is a very specific element of the public policy and management mix. It normally consists of an investment, that is the creation of an asset which will generate benefits, financial and non-financial over a period of more than one year. This is not universally applicable as a working definition, as 'project' is often used to describe a set of discrete activities that do not always involve a capital investment, to achieve some specific goals. In this module, however, we will be dealing with capital investments.

This course is both specific and technical, and will enable you to carry out financial and economic appraisals. It will give you enough theory to understand the financial and economic processes

involved in such an appraisal, but the emphasis is on practice, with some critique of the methods involved.

Learning Objectives

- After following this course, students are able to describe project and programme appraisal and evaluation. Use cash flow analysis and spreadsheets for investment appraisal.
- They will be able to explain why, and under which conditions, appropriate evaluation and investment appraisal techniques be applied.
- They will be able to evaluate the economic theory of diminishing marginal utility of income and consumption and explain its use as a basis for determining welfare or distributional weighting.
- They will be capable of identifying the problems of risk and uncertainty associated with project identification, preparation, monitoring and evaluation.

Outline

Introduction to project evaluation

Investment Appraisal Techniques I

- Introduction
- Cash Flow Analysis
- Private Sector Appraisal Techniques

Investment Appraisal Techniques II

- Introduction
- Net Cash Flow and the Working Capital
- Mutually Exclusive Projects and Other Issues

Social Cost-Benefit Analysis

- Introduction
- The main stages of a social cost-benefit analysis
- Theoretical basis of social cost-benefit analysis

Social Cost-Benefit Analysis

- Social cost-benefit analysis case study
- The Social Discount Rate (SDR)

Valuation Methodologies in Social Cost-Benefit Analysis

- Introduction
- Revealed Preference Methods
- Stated Preferences – Contingent Valuation

Sector Analysis and Case Studies in SCBA

- Introduction
- Transport Projects
- Water

Sector Analysis and Case Studies in SCBA

- Education
- Environment
- Health Care
- Cost-Effectiveness Analysis (CEA)

Risk and Uncertainty Analysis

- Introduction to risk and uncertainty
- Techniques for risk analysis
- Uncertainty risk and large projects

Techniques for Risk and Uncertainty

- Spreadsheet Modelling and Risk Analysis

Distributional Issues and Social Cost-Benefit Analysis

- Introduction
- Analyzing the Distribution of Costs and Benefits

Distributional Issues and Social Cost-Benefit Analysis

- Displaying Distributional Impacts
- Distributional Weighting
- Multi-Criteria Analysis (MCA)

Critique and Reflection

- Introduction
- Benefit Analysis
- The Strengths and Limitations of Social Cost-Benefit Analysis
- SCBA in Developing Countries

Textbook(s)/ Reference Book(s)

- Anthony E Boardman, David Greenberg, Aidan R Vining and David L Weimer (2014)
- Cost-Benefit Analysis – Concepts and Practice, International (4th) Edition, Pearson.
- Research Articles from Journals indexed by Thomson Reuters.
- Research Articles from News Paper

Annexure C**Financial Details for the MS Economics Program**

	Sem-ester	Batch 1 x 15 ¹	Batch 2 x 15	Batch 3 x 15	Batch 4 x 15	Batch 5 x15	Batch 6 x15	Batch 7 x15	Batch 8 x15	Batch 9 x15	Batch 10 x15	Semester Wise Total Earning	Total Yearly Earning (B5 & B6)
2018	1	1,710,000										1,710,000	4,485,000
	2	1,065,000	1,710,000									2,775,000	
2019	3	570,000	1,065,000	1,710,000								3,345,000	6,690,000
	4		570,000	1,065,000	1,710,000							3,345,000	
2020	5			570,000	1,065,000	1,710,000						3,345,000	6,690,000
	6				570,000	1,065,000	1,710,000					3,345,000	
2021	7					570,000	1,065,000	1,710,000				3,345,000	6,690,000
	8						570,000	1,065,000	1,710,000			3,345,000	
2022	9							570,000	1,065,000	1,710,000		3,345,000	6,690,000
	10								570,000	1,065,000	1,710,000	3,345,000	
¹ Student Fee income is calculated based on $(114000 * 15)$ for the first semester Student fee in the 2nd and 3rd semester is calcuted by multiplying Credit hours to its fee $(5500 * X)$													31,245,000

Key Assumptions:

1. 15 Students will be enrolled every year starting spring 2018
2. No additional faculty member is required for the PhD Program

Cost of Books, Subs & Memberships (B10)	Expenses required for Starting the Program (B12)	Annual Recurring Expenditures in Subsequent Years 10% increase (B13)	Total Cost of Program (B14= B10 +B12+ B13)	Projected Annual Net Earning in Subsequent Years 10% increase (B16 & B18)
300,000	300,000		600,000	3,885,000
50,000	-	330,000	380,000	6,310,000
50,000	-	363,000	413,000	6,277,000
50,000	-	399,300	399,300	6,290,700
50,000	-	439,230	439,230	6,250,770
				29,013,470

List of Books

#	Book Name	Price
1	"Managing Government Expenditures" by Salvatore Schiavo-Campo & Daniel Tommasi	25000
2	Natural Recourse and Environmental Economics, 3rd Edition, by Roger Preman, Yue Ma, James McGilvray & Michael Common	3000
3	Ecological Economics, Principles and Applications, by Herman. E. Daly and Joshua Farley	2600
4	Walter Nicholson, " Intermediate microeconomics" 9th edition, South Western College Publishing, USA	14000
5	Kolstad, Charles. Environmental Economics. 2nd ed. Oxford University Press, 2010. I	15000
6	Microeconomic Analysis, Hal Varian, Third Edition	12013.7
7	Walter Nicholson, " Advance microeconomics " 9 th edition, South Western College Publishing, USA	5785.26
8	McConnell Brue, " Microeconomics" 16th edition, Glencoe/McGraw-Hill	11473.7
9	Nicholson, and Snyder, Microeconomic Theory: Basic Principles and Extensions (10th Edition)	13475.8
10	D.Romer, Advanced Macroeconomics, third edition.	2104.2
11	Basic Econometrics, Gujrati D.N. and Proter D.C. 5th Edition, 2009.	19472.6
12	Johnston, J. and J. Dinardo, Econometric Methods, (4th edition), McGraw-Hill, 1997Applied Econometrics, Asterio D. and Hall S. 2nd Edition, 2011.	10478.7
13	A.C. Chiang and Kevine W. Fundamental Methods of Mathematical Economics, 4th edition, 2005.	25243.2
14	Mathematics for Economists, Carl Pearson and Lawrence Blume, latest edition.	17484.2
15	Mathematics for Economics, Michael et al., second edition.	7711.58
16	Carl Walsh, Monetary Theory and Policy, 3/e, MIT Press, 2010	4335.79
17	Kolstad, Charles. <i>Environmental Economics</i> . 2nd ed. Oxford University Press, 2010.	13257.9
18	Ecological Economics, Principles and Applications, by Herman. E. Daly and Joshua Farley	2520
19	Economics of Natural Recourses and the Environmental by David W. Pearce & R. Kerry Turner	1523.16
20	Natural Recourse and Environmental Economics, 3rd Edition, by Roger Preman, Yue Ma, James McGilvray & Michael Common	6038.88
21	Principles of Environmental Economics by Ahmed Hussein.	24210.5

22	Acemoglu, Daron. <i>Introduction to Modern Economic Growth</i> . Princeton University Press, 2009. ISBN: 9780691132921.	3554.07
23	Romer, D. (1996), Advanced Macroeconomics, McGraw-Hill.	5288.42
24	G.J. Borjas Labor Economics (3rd ed. McGraw Hill)	15000
25	Others	100000
	Total Cost of all books	300972

TRANSCRIPT OF HOD MS BUIC'S PRESENTATION

Slide-1

30th ACM New Agenda Items
HOD MS BUIC Dr. Muhammad Ali Saeed
3rd-4th October April 2017

Slide-2

Start of 2 Years MS Economics program at BUIC in Evening

This program will provide the advanced knowledge and skills required for a career as a professional economist in public service or the private sector.

Slide-3

Start of 2 Years MS Economics program at BUIC in Evening

List of Capital Sector Universities offering MS Economics

- QAU MSc and Mphil (Both are Two Years/4 semester programs)
- NUST MS (1.5 Years/ 3 semester program)
- COMSATS Islamabad MS Economics (2 Years/ 4 semester program)
- IIUI MSc Economics to 14 Years graduates (2 Years/ 4 semester program)

Lahore Sector

- LUMS MS Economics 1.5 Years program
- LSE MPhil (2 Years program) and MSc Economics (1 Year program)

Slide-4

Eligibility criteria

Applicant must have 16 Years Education in BS in Economics / Economics & Finance / Banking & Finance /Accounting/Statistics and/or any other relevant degree with 2.5/4 CGPA or 50% marks. Students with non-relevant background will take deficiency courses as per HEC rules.

15-18 Credit hours deficiency can be covered in 6 months

30-36 Credit hours deficiency can be covered in 12 months

Correction in New Programme Proposal for MS Economics:

To be read as 2 Years and 4 semester

Recommendation

2 Years MS in Economics may start as Evening program at MS Department at BUIC with effect from Spring 2018 after seeking approval from HEC

Appendage 3018

**PROPOSAL FOR LAUNCHING
PHD IN ECONOMICS**

Discussion:

In concurrence with Bahria University Islamabad's strategic plan of diversification and introduction of new courses it is proposed that a new program PhD in economics be launched from the spring 2018. BS Economics is a program that has already been introduced at the university and MS. Economics also being proposed for introduction. The university has a large number of PhD faculty at the Management Science Department specializing in Economics so there are no major HR implications for the introduction of this program either. It would make sense to introduce this program as the universities own MS. Economics graduates might end up enrolling in the program. The following universities are already offering PhD in Economics in Islamabad. Quaid-I-Azam University, NUST, PIDE, NUML, UAAR. The point of discussion in the meeting is whether this program should be started or not.

Proposal Form for launch of new PhD Economics Program is placed at [Annexure A](#).

The Course Description, the Roadmap and Course Contents are provided at [Annexure B](#).

HR Implications:

There is no HR implication, as the existing university faculty and administrative staff will be sufficient for the said purpose. The details are provided in Annexure – A.

Financial Implications:

6 PhD scholars will be admitted into the first semester of program. The details are provided in Annexure – C.

Recommendations

The FBOS in its 14th meeting placement of the agenda for launch of PhD Economics program before the ACM.

NEW PROGRAMME PROPOSAL FORM

A. ACADEMIC DETAILS	
1	Faculty/Department: Management Sciences
2	Name of the Programme: PhD in Economics
3	Mission of the Programme: "To prepare researcher in the methods and ideas of modern economics at par with international standards to produce economists who can undertake both theoretical and applied economic research that will help advance the current body of knowledge in the field. "
4	Objectives of the Programme: The objectives of the doctoral program are to prepare scholars to: <ul style="list-style-type: none"> • conduct high quality research in the field of economics and disseminate it to scholarly and other audiences; • teach economics research techniques, inside or outside the classroom; • engage in service and outreach that enhances scholarship and its public impact; and • excel in a variety of institutional settings, including universities, industry and government research labs, and think tanks particularly focusing on the economics related fields.
5	Outcomes of the Programme:

	<p>The primary objective of the PhD in Economics is to produce research economists of the international standard. The scholars will acquire the background and skills necessary for careers as university teachers and as practitioners of economics. The curriculum includes a comprehensive treatment of modern theory and empirical techniques. Students are exposed to a broad range of applied fields and select specializations. The typical student can expect to spend two full years completing the required course work. The remaining time in the program is usually spent engaging in dissertation research and participating in seminars. The program will produce research economists who will</p> <ul style="list-style-type: none"> • Demonstrate an understanding of microeconomic and macroeconomic theory. • Be able to Identify and synthesize existing body of knowledge. • Be able apply economic theory to issues in fields of economics • Be able to conduct empirical research in the divers fields of economics • Present economic theory and applications in written and oral form. • And most importantly be able to make significant contributions to the current state of knowledge in the field of economics.
6	<p>Rationale for the Programme:</p> <p>The purpose of the Ph.D program in Economics is to educate scientists who will advance the frontiers of economic knowledge through research and teaching.</p> <p>The program is designed to provide students with sound training in economic theory, and the quantitative tools required for innovative research on economic problems. Equally important, the program is structured to allow students both time and guidance for research activities.</p> <p>Amongst other things this means attending seminars organized by the Department thereby helping expose doctoral researchers to new ideas emerging from outside their own area of specialization. It also requires actively participating in PhD workshops and conferences organized by Research Groups and institutions outside the University.</p>
7	<p>Brief Description of the Programme:</p> <p>The program will require the students to undergo course work during the first year of their degree program.</p> <p>The students will have to pass exams in the 3 core subjects and 3 elective subjective of their choice to attain a total of 18 credits hours.</p> <p>After attaining 18 credit hours the student will be required to pass their “Comprehensive Examinations” to become eligible for the research stage of the program.</p> <p>The research stage of the program will involve taking research guidance from their assigned supervisors worth 36 credit hours over a period of 2 years.</p>
8	Duration: Minimum 3 Years – Maximum 8 Years
9	Venue(s): On Site/Off Site/Both On & Off Site (<i>tick one/strike-through the ones not applicable; if Off Site, give details</i>)
10	<p>Programme Scheduling Format:</p> <ul style="list-style-type: none"> • Morning/Evening/Weekend (<i>tick one/strike-through the ones not applicable</i>) • Bi-Semester/Trimester/Semester+Summer Session/Annual/Bi-Annual (<i>tick one/strike-through the ones not applicable</i>)
11	Proposed Date of Commencement: Spring 2018
12	Mode of Study/Examination: Classroom Lectures for 18 credit hours of coursework with 36 credit hours of thesis requiring seminars with the supervisor.
13	Additional Faculty Member(s) Required: No
14	Additional Skilled-Worker(s) Required: N/A
15	Additional Classroom(s) required: No
16	Additional Requirement for Laboratories: No
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Yes 250000

	See detail prices of books in Annex 'C'
18	Minimum Entry Level: 17.5/18 Years of education As Per HEC rules (As per BU Policy)
19	<p>Admission Criteria: MS/ M-Phil economics degree (17.5/18 years of education) with consistently good academic record and minimum of 60% marks in the annual system or CGPA of 3.0 out of 4.00 in the semester system.</p> <p>A minimum of 60% marks in the GAT- subject test conducted by the National Testing Service (NTS). All candidates seeking admission to the PhD program are required to provide the GAT-Subject score. <i>Or Candidates must have atleast 70% score in university based subject test.</i></p>
20	Additional/Different Examination Requirement: A (2000 word Maximum) "Statement of Purpose" to be submitted to be evaluated by the admission committee
21	Number of Admissions Expected for First Intake: 6
22	Number of Admissions Planned/Expected for Subsequent Intakes: 6 per year
23	<p>Referred by: (delete which is inapplicable) FBOS: (Indicate the FBOS meeting reference and Item No) Competent Authority: (Indicate the File No & date; reproduce the decision)</p>
24	<p>Complete Plan of Studies, inclusive of complete Roadmap: <i>Annex 'A' attached</i></p>
25	<p>Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) <i>Annex 'B' attached</i></p>
B. FINANCIAL DETAILS	
1	Source of Funding: BU: Fully/Partially: Fully
2	<p>Degree Duration: <u>Annual or Semester System:</u> 3 Years to Maximum of 8 years Semester: 6 Total Number of Credit Hours: 54</p>
3	<p>Expected fee to be charged based on Cost & Benefits Analysis: (show working) Per annum fee: or Fee rate per credit hour: 5500</p>
4	Expected Number of students for 1st & 2nd Intakes: 6 in the first year and 6 in the next
5	<p>Expected Earning from first two Intakes (B5): 852,000 See Appendix C. For Detailed Working Of The Earning</p>
6	<p>Expected Earning for the Next Five Years (B6): Cumulative : 9,275,500 See Annex C. For Detailed Working Of The Earning</p>
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): N/A
8	Cost of Additional Laboratory Equipment/Tools (B8): N/A
9	Cost of Additional Classrooms (B9): N/A
10	<p>Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): 250000 See Annex C. For Detailed Working</p>
11	Off-Site rental Expenses and Cost of other Fixtures (B11): N/A
12	<p>Miscellaneous Expenses required for Starting the Program (B12):</p> <ul style="list-style-type: none"> - Advertisement: 200,000 - Printing & Stationery : 100,000 - Admin Cost :0 - Any other - Total <p>300,000</p>
13	<p>Annual Recurring Expenditures in Subsequent Years (B13):</p> <ul style="list-style-type: none"> - Salaries: 662,400/ 662,400/ 662,400/ 1,202,400 / 1,202,400 (Yearly) - Rentals: - Subscriptions/Memberships: - Advertisements:

	<ul style="list-style-type: none"> - Printing & Stationery: - Admin Cost - Any other - Total: 1,212,400 /728,640/ 728,640/1,322,640/1,322,640 <p>See Annex C. For Detailed Working</p>
14	Total Cost of the Programme (B14): For the first year = 1148300
15	Net Cost of the Programme (B15): N/A
16	Net Earnings in First Year (B16): -360400
17	Projected Annual Gross Earning in Subsequent Years (B 17):
18	Projected Annual Net Earning in Subsequent Years: -360,400 / 777,360 / 1,431,360 /837,360 /837,360

Annex 'A'

PLAN OF STUDIES PHD (ECONOMICS) PROGRAM

The PhD is an intensive program structure comprising “Coursework” and “Supervised Research Thesis”. The course work components are specifically designed to maximize learning and develop a comprehensive skill base required to undertake thesis research. Assessment of each subject will be based on a combination of individual assignments and examinations. Academic standards will be of the Doctoral levels and students will be required to pass each subject before progression to the thesis/dissertation is permitted. The structure of the program is as follows

ROAD MAP FOR PHD PROGRAM**First Semester Courses**

S.No.	Course Code	Course Titles	Level	Credit Hours
1	ECO 801	APPLIED MICROECONOMIC THEORY	Core	3
2	ECO 802	APPLIED MACROECONOMIC THEORY	Core	3
4		ELECTIVE 1	Elective	3

Second Semester

S.No.	Course Code	Course Titles	Level	Credit Hours
1	ECO 803	ADVANCED ECONOMETRIC METHODS	Core	3
2		ELECTIVE 2	Elective	3
3		ELECTIVE 3	Elective	3

List of Electives

S.No.	Course Code	Course Titles	Credit Hours
1	ECO 810	AGRICULTURAL DEVELOPMENT AND POLICY	3
2	ECO 820	DEVELOPMENT ECONOMICS	3
3	ECO 830	ECONOMIC GROWTH AND DISTRIBUTION	3
4	ECO 840	ECONOMICS OF POPULATION	3
5	ECO 850	ENVIRONMENTAL ECONOMICS	3
6	ECO 860	INTERNATIONAL ECONOMICS	3
7	ECO 870	MATHEMATICAL ECONOMICS	3
8	ECO 880	MONETARY ECONOMICS	3
9	ECO 890	TOPICS IN ADVANCED ECONOMETRICS	3

Supervised Research (PhD Thesis SRD 901 – Year 2 & 3)

S.No.	Course Code	Course Titles	Credit Hours
1	SRD 901	Supervised Research (Formal Thesis Proposal Development)	9
2	SRD 901	Supervised Research (Formal Thesis Proposal Defence; Research Plan and Approach Towards Thesis Write-up)	9
3	SRD 901	Supervised research (Thesis Write-up): Field of inquiry & Review of Literature Theoretical Framework Research Method & Design Data Collection & Analysis	9
4	SRD 901	Supervised Research (Thesis Write-up): Findings, Discussion and Conclusion; Defence of First Draft of thesis; Submission of Revised Draft of Thesis.	9

Subjects	Credit Hours
Core Subjects	9
Electives	9
Supervised PhD Dissertation Writing	36
Total Credit Hours	54

COMPREHENSIVE EXAM

The PhD Scholar will be eligible to under a Comprehensive exam after the first year on completion of the course work (18 Credit Hours). The Comprehensive examinations on the two core courses Microeconomics and Macroeconomics will be undertaken on scheduled takes and exemptions will be given for late appearance will be provided as per Bahria University policy. The scholar will be only allowed two attempts at clearing the comprehensive exams.

The comprehensive exam marks will be distributed as follows:

Comprehensive examination marks distribution for each exam			
Written	Viva	Total	Passing Marks
85	15	100	65

On passing the comprehensive exam the students will be eligible to proceed to research work. The scholar will undergo 36 credits hours of research supervision for the next 2 years.

COURSE DESCRIPTIONS**CORE COURSES****ECO 801: APPLIED MICROECONOMIC THEORY**

Following topics are covered in this course: Theories of choice and production, General Equilibrium Theory, Fundamental theorems of Welfare Economics, Problems of market failure in the presence of externalities and public goods and Economics of information.

ECO 802: APPLIED MACROECONOMIC THEORY

This course aims to provide training in modern advanced macroeconomic theory and its application. A thorough understanding of some fundamental workhorse models in macroeconomics used to deal with economic problems are going to be studied in this course. The course is divided into growth theories consumption theory, investment theory, real business cycle theory and the New Keynesian theory. The course content covers economic growth, business cycles, nominal rigidities and economic fluctuations, overlapping generation model and monetary and fiscal policy issues. Topics included are: Economic Growth, Business Cycles, Nominal Rigidities and Economic Fluctuations,

Competitive Equilibrium Business Cycles, Overlapping Generation Model (with and without money), Monetary and Fiscal Policy Issues.

ECO 803: ADVANCED ECONOMETRIC METHODS

Econometrics is an empirical application of various economics theories. The main objective of the course is to introduce the students about the advanced econometrics techniques and to prepare them to do their own applied work. In this course, will cover regression analyses and various estimation problems, qualitative analysis, ARCH and GARCH and simultaneous equation system. We will also cover various econometric issues, such as autocorrelation, multicollinearity and heteroskedasticity and their proper remedial measures. The use of various relevant software is also essential to accomplish the task. Simple and Multiple Regression Analysis, Violation of basic assumptions, Estimation with deficient data, Formulation and Estimation of Special Models (qualitative response models), Generalized Linear Regression Model and its Application, Simultaneous Equation Systems, Time Series Analysis, Dynamic Econometric Model.

ELECTIVE COURSES

ECO 810: AGRICULTURAL DEVELOPMENT AND POLICY

This course is comprehensive look at agricultural development policy. It provides a clear, systematic review of important classes of policy issues in developing countries and discusses the emerging international consensus on viable approaches to the issues. It will include the following: Review of Agricultural System and Policies in Pakistan, Agricultural supply topics including: Product and Factor Prices, Analysis of Policy Options, Price Support and Input Subsidies, Price Policy and Adoption of New Technologies, Interrelated Commodities, Water Pricing and Project Evaluation Principles as applicable to Third World Countries.

ECO 820: DEVELOPMENT ECONOMICS

Harrod-Domar and Neoclassical Models; Technical Progress, Optimum Savings, and the Golden Rule; Savings and Capital Accumulation Development theories; Measuring Contributions to Growth; Population Growth; Labour and Employment; Investment in Human Capital; Entrepreneurship; Industrialisation; the Choice of Technology; Agriculture and Agrarian Reforms; Development Strategies; Development, Equity, and Welfare; Food Aid, Saving Disincentives; Foreign Investment and MNCs; Decision Models; Balanced and Unbalanced Growth; Migration from LDCs; Political Economy of Trade and Development; North-South Models.

ECO 830: ECONOMIC GROWTH AND DISTRIBUTION

This course is a course on advanced macroeconomic modelling focusing on economic growth. It will focus both on models of economic growth and their empirical applications, and try to shed light on the mechanics of economic growth, technological change and sources of income and growth differences across countries. The course includes: Historical development in the theory of economic growth like growth models developed by Harrod-Domer, Solow, and others; Recent developments in the theory of economic growth like Endogenous Growth Models, Increasing Returns to Scale; Empirical studies of the determinants of productivity and economic growth at aggregate and sectoral, regional level

ECO 840: ECONOMICS OF POPULATION

This is an advance-level course in Economics of labor and Population. It is designed for post-graduates who wants to study environmental economics concerns with an interdisciplinary focus. The course will introduce students to the analysis of the economic consequences of demographic change; emphasis will be placed on analytical techniques drawn from demography as well as economics. It will help students to learn about how individuals and households make important life decisions, in particular: Investment in one's own human capital, Interaction tactics with the labor market, and Decision analysis of living with whom and where; and its impact on one's income, wealth, health, happiness and other measures of wellbeing. These are the core decisions studied in r

population and labor economics. The course will discuss examples from both developed and developing countries to give students a well-rounded introduction to the literature in this broad research area.

ECO 850: ENVIRONMENTAL ECONOMICS

This is an advance-level course in environmental economics. It is designed for post-graduates who wants to study environmental economics concerns with an interdisciplinary focus. More specifically, the course attempts to incorporate advanced ideologies of both microeconomics and ecology that are essential for a comprehensive understanding and critical assessment of the human's historical struggles to "coexist" with the natural environment. These ecological and economic principles are also used to shed light on some contemporary and controversial environmental policy issues. Right from the outset it should be understood that this course is not aimed at a study of a specific environmental issue. Instead, the course intends to delve into the theoretical underpinnings that are critical to a clear understanding of most contemporary environmental and natural resource problems. Thus, the emphasis is on a systematic development of theoretical principles and conceptual frameworks essential for a comprehensive analysis of environmental and natural resource issues and the assessments of alternative environmental policy instruments, in general.

ECO 860: INTERNATIONAL ECONOMICS

The Ricardian model; the Heckscher-Ohlin model; the Specific Factor model; Many Goods and Factors Model; Economies-of-Scale and Monopolistic Competition; Non-traded Goods Model; Theories of Protection; International Factor Mobility; and the Gains from Trade. Prerequisite: E 600.

ECO 870: MATHEMATICAL ECONOMICS

The structure of the course includes advanced approaches of linear algebra, multivariable calculus, a general optimization problem of function of several variables both without restrictions and with restrictions formed by equalities and inequalities. The course material should teach students to understand and prove the basic methods of linear algebra and calculus, and also to investigate the economic problems of comparative statics and optimization within the framework of advanced tools of mathematical models. The purpose of the course is not so much acquisition of new skills in a solution of mathematical problems relevant to economic applications, but study of methods of proofs and strict reviewing of some sections of mathematics.

ECO 880: MONETARY ECONOMICS

The course is an advance course for students of PhD. Strong skills in dynamic optimization and growth models is a prerequisite for this course. The course will introduce the students to monetary macro models under flexible prices or with nominal rigidities. Recent research papers on different issues using these techniques will also be discussed. The topics covered include monetary policy operations, Solow's model, Tobin's growth model, MIU model, Ramsey model extensions, Cash-in-Advance Model, Lucas Islands Model and its extensions, normal price and wage rigidities, DSGE Model, term structure of interest rates and the link between monetary policy and financial crisis.

ECO 890: TOPICS IN ADVANCED ECONOMETRICS

The main objective of the course is to introduce the students about the basic econometrics techniques and to prepare them to do their own applied work. The course will focus on modern econometric techniques, addressing both technical derivations and practical applications. Applications in the areas of microeconomics, macroeconomics and International Economics will be considered. In this course, we will cover univariate and multivariate regression analyses and various estimation problems, qualitative analysis and simultaneous equation system. We will also cover various econometric issues, such as autocorrelation, multicollinearity and heteroskedasticity and their proper remedial measures. It will also cover various time series, cross sectional and panel data analyses.

**Detailed Week-wise Course Outlines
APPLIED MICROECONOMICS THEORY**

Course Name	Applied Microeconomics	Prepared On	July 2017		
Course Code	Eco 801				
Credit Hours	3				
Course Prereq. Name	NONE				
Course Prereq. Code					
Course Type	Core Course	Revised On			
Program	Ph.D Economics				
Semester	1				
Course Description					
<p>Microeconomics is the study of individual economic units and their rational behavior regarding optimal decision making in real life. The students in this course learn the concepts of optimal resource allocation as consumers, producers and managers of businesses. The students also learn pricing policy of the firms under various market situations of perfect and imperfect competition. Economic decision-making in the event of various government policies and government regulations regarding taxation and externalities is the special focus of this course on the application side.</p>					
Course Learning Outcomes					
<p>This course is aimed at highlighting the use of micro economics in business decision. The main objective of the study of this course is to enhance the students' knowledge about:</p> <ul style="list-style-type: none"> Optimal resources allocation: The resources of factors of production are always scarce and limited with the business firm. This course will enlighten how the productive resources are optimally allocated in the production of numerous goods and services. Optimal production decision: The business firm can produce goods with different alternative techniques. They have to continuously face the problem of the technique to be chosen. Because, the resources like labor, capital are limited. The course will examine the behaviors of individuals and firms in the market and the implications of their choices, using basic economic principles and tools. Pricing policy: The firms well have to face the problem of pricing their productions. The firm should be able to fix appropriate price to achieve its objectives. The course provides the basis for analyzing and solving the pricing problems. Business decision making: It contributes improved decision making in the areas of demand analysis, optimal production decision, pricing decision to maximize profit. It helps business man to determine the price of different goods and factors of production. 					
Teaching & Learning Methodology					
<p>All of you are required to participate constructively in discussions. You are expected to utilize web sites, periodicals, and other resources to contribute in class discussions and complete necessary assignments. The following methods and forms of study are used in the course:</p> <ul style="list-style-type: none"> Lectures Attendance and punctuality Overall discipline and behavior in class. Each participant's involvement and constructive contribution in class discussion. 					
Textbook(s)/ Reference Book(s)					
<ul style="list-style-type: none"> Microeconomic Analysis, Hal Varian, Third Edition. Walter Nicholson, " Advance microeconomics" 9th edition, South Western College Publishing, USA McConnell Brue, " Microeconomics" 16th edition, Glencoe/McGraw-Hill Nicholson, and Snyder, Microeconomic Theory: Basic Principles and Extensions (10th Edition) 					
Grading Policy					
	Assessment Instruments	Percentage			
	Quizzes/Class Participation	10%			
	Assignments	20%			

	Mid Term Exam	30%	
	Final Exam	40%	

WEEK-WISE COURSE OUTLINE			
Week	Contents/Description	Learning Outcomes	
1	Applied Consumer Theory <ul style="list-style-type: none"> • Consumer preferences • Utility Maximization and Comparative Statistics • Preferences ordering axioms • Utility functions & indirect utility functions • Hicksian Demand Functions 	<ul style="list-style-type: none"> • Consumer behavior • Application of utility functions • Monotonic functions • Understanding about comparative statistics and derivation of demand functions 	
2	Applied Consumer Theory (continue) <ul style="list-style-type: none"> • Duality and the Slutsky Income and Substitution Effects • Solution of dual problem • Roy's identity • Shepherd lemma • Elasticity and its computation 	<ul style="list-style-type: none"> • Duality and use of IUF • Application of duality and solution to various economic and consumer problems 	
3	Applied Producer Theory <ul style="list-style-type: none"> • Production Sets and Functions • Isoquants and the Marginal Rate of Technological Substitution • The Nature of Cost • Long Run Cost Minimization and Long Run Cost Functions 	<ul style="list-style-type: none"> • Learn about cost theories and its applications in microeconomics • Behavior of cost curves 	
4	Applied Producer Theory (continue) <ul style="list-style-type: none"> • Short Run Cost Functions • Duality between Cost and Production • Long run profit maximization and Supply • Short run profit maximization and Supply 	<ul style="list-style-type: none"> • Duality and comparative statistics of producer theory • Linkages between short run and long run cost curves behavior 	
5	Partial Competitive Equilibrium <ul style="list-style-type: none"> • Market Demand • Short Run Supply • Equilibrium and Comparative Statics • Long Run Competitive Equilibrium • Ricardian Rent • Welfare Analysis and its Applications 	<ul style="list-style-type: none"> • Understanding about partial competitive equilibrium and its application. 	
6	General Equilibrium Exchange - Edgeworth Box Representation - Pareto Optimality - Competitive Equilibrium - First and Second Welfare Theorems - The Core	<ul style="list-style-type: none"> • The student will learn about the application of Edgeworth box for measuring general equilibrium 	
7	General Equilibrium (continue) Production - Robinson Crusoe Economy - Production Feasible Sets and Production Possibility Frontier - Pareto Optimality and Competitive Equilibrium Revisited	<ul style="list-style-type: none"> • The student will learn about the application of PPF and feasible set solution 	
8	REVISION WEEK		
9	MID TERM EXAM		

WEEK-WISE COURSE OUTLINE			
10	Uncertainty about choices <i>Objective Uncertainty</i> - Objects of Choice and Preference <i>Functional</i> - Axiomatic Characterization of Expected Utility - Arrow-Pratt characterization of comparative risk aversion - Rothschild-Stiglitz characterization of comparative risk aversion - Demand for Insurance	<ul style="list-style-type: none"> The student will learn about the application of various aspect of choice and uncertainty Learn about the use of Arrow-Pratt characterization 	
11	Uncertainty about choices (continue) Subjective Uncertainty - States, Events, Outcomes, and Acts - Probabilistic Sophistication - Expected Utility Preferences over subject acts - State Dependent Utility Evidence and Alternative Models - Evidence on the Independence Axiom (Allais Paradox) - Non-expected Utility Functions - Evidence on Probabilistic Sophistication and the Stability of Preferences - Ellsberg Paradox and Ambiguity Aversion	<ul style="list-style-type: none"> Understanding about subjective uncertainty and its use in microeconomics Use of utility models Use of alternative functional utility models 	
12	Competitive Markets <ul style="list-style-type: none"> Short run and long run equilibrium Mathematical models of competitive markets Comparative analysis 	Understanding about market structure and mathematical treatment of market economy during perfect competition	
13	Game Theory <ul style="list-style-type: none"> Basic concepts Prisoner's Dilemma Nash Equilibrium Strategies of game theory 	<ul style="list-style-type: none"> Understanding and use of game theory in economics Applications of strategies in game theory 	
14	Profit Maximization <ul style="list-style-type: none"> Nature of firms and profit maximization behavior Short run and long run behavior of profit maximization firms 	<ul style="list-style-type: none"> How to use profit maximization tools in economics? Duality Shepherd Lemma applications 	
15	Imperfect Market Structure <ul style="list-style-type: none"> Nature of Imperfect markets Profit maximization behavior of imperfect markets Price Discrimination 	Understanding about behavior of imperfect markets and their profit maximization behavior	
16	Asymmetric Information <ul style="list-style-type: none"> Principal Agent Model Moral Hazard types pricing behavior Market signaling 	Understanding about market behavior via asymmetric information modeling	
17	REVISION WEEK		
18	FINAL EXAM		

APPLIED MACROECONOMICS THEORY

Course Name	APPLIED MACROECONOMIC THEORY (Core)	Prepared On	July 2017
Course Code	Eco 802		
Credit Hours	3		

Course Prereq. Name		Revised On		
Course Prereq. Code				
Course Type	Core Course			
Program	PhD Economics			
Semester				
Course Description				
This course aims to provide training in modern advanced macroeconomic theory and its application. A thorough understanding of some fundamental workhorse models in macroeconomics used to deal with economic problems are going to be studied in this course. The course is divided into growth theories consumption theory, investment theory, real business cycle theory and the New Keynesian theory. The course content covers economic growth, business cycles, nominal rigidities and economic fluctuations, overlapping generation model and monetary and fiscal policy issues.				
Course Learning Outcomes				
Sr.No.	Description			
<i>On completion of the course, Student will have following general understanding such as:</i>				
1	Analyse and evaluate the most fundamental workhorse models in macroeconomics;			
2	Evaluate state-of-the-art (applied) macroeconomic literature in a broad range of relevant policy issues;			
3	Be familiar with basic macroeconomic models of growth			
4	Learn how to use key methodological tools in modern dynamic macroeconomics.			
Teaching & Learning Methodology				
As in previous course				
Textbook(s)/ Reference Book(s)				
<ul style="list-style-type: none"> D.Romer, Advanced Macroeconomics, the 3rd edition. 				
Grading Policy				
As in previous course				
WEEK-WISE COURSE OUTLINE				
Week	Contents/Description	Learning Outcomes		
1	Introduction to Macroeconomic <ul style="list-style-type: none"> Stylized facts on Economic Development Fundamental Causes of Economic Development 	<ul style="list-style-type: none"> Show Disparity in Cross Country Per Capita Income Help establish how to investigate relationship between economic growth and country specific characteristics discuss briefly how the world distribution of income across countries has come to be so unequal 		
2	Introduction to the Solow Growth Model <ul style="list-style-type: none"> (1) Modelling of the Solow Growth Model 	<ul style="list-style-type: none"> Learn the Basics of the Solow Model Learn how to mathematically model the Solow model 		
3	Introduction to the Solow Growth Model <ul style="list-style-type: none"> (2) Modelling of the Solow Growth Model 	<ul style="list-style-type: none"> Learn the Basics of the Solow Model Learn how to mathematically model the Solow model Learn how to use Solow Model to interpret 1st Lecture facts on growth 		
4	Introduction to Ramsey-Cass-Koopmans Model (1)	<ul style="list-style-type: none"> Learn how the basics of the ramsey model Learn Phase Diagram Learn about Saddle-Path Stability 		
5	Introduction to Ramsey-Cass-Koopmans Model (2)	<ul style="list-style-type: none"> Learn how the basics of the ramsey model Learn Phase Diagram Learn about Saddle-Path Stability 		
6	Overlapping Generations Models (1) <ul style="list-style-type: none"> Basic model under Finite Time Horizon 	<ul style="list-style-type: none"> Learn how to model Overlapping Generations Model using Finite Time Horizon 		

			<ul style="list-style-type: none"> • Learn about the sources and conditions for dynamic inefficiency in overlapping generations model • Learn about applications of model
7	Overlapping Generations Models (2) <ul style="list-style-type: none"> • Infinite Time Horizon • Credit Market Friction • Exchange Rate Dynamics 		<ul style="list-style-type: none"> • Learn how to model Overlapping Generations Model using infinite Time Horizon • Learn about the sources and conditions for dynamic inefficiency in overlapping generations model
8	Consumer Theory		<ul style="list-style-type: none"> • Learn about the permanent income hypothesis • Learn about dynamic theories of consumption and saving • Learn about precautionary Savings, liquidity constraints and portfolio choice.
9	Mid Term Exam		
10	Investment Theory <ul style="list-style-type: none"> • Standard Neoclassical Investment Theory • Irreversible Investment and Borrowing Constraints 		<ul style="list-style-type: none"> • Learn about standard investment theories • Learn about investment under uncertainty • Learn about liquidity constraints
11	Real Business Cycle Theory Dynamic Programming		<ul style="list-style-type: none"> • The students will learn about dynamic programming using recursive deterministic models and recursive stochastic models
12	Real Business Cycle Theory <ul style="list-style-type: none"> • Basic Model with Capital and Leisure 		<ul style="list-style-type: none"> • The student will learn how to formulate the basic model with Capital and Leisure • Learn about Log linearization • Learn about Calibration • Learn about Impulse Responses
13	Real Business Cycle Theory (Real Rigidities) <ul style="list-style-type: none"> • Extension of Basic Model with Capital and Leisure • Expectation Driven Business Cycles 		<ul style="list-style-type: none"> • The student will learn how to incorporate real rigidities' • Learn about habit formation, adjustment costs
14	Classical Monetary Models		<ul style="list-style-type: none"> • The students will get a brief overview about monetary models • Learn about the cash-in-advance model • Learn about money-in-utility model
15	Nominal Rigidities		<ul style="list-style-type: none"> • The students will learn about staggered price adjustment model
16	New Keynesian Business Cycle Model		<ul style="list-style-type: none"> • The students will learn about the new Keynesian Philips curve • Learn about optimal monetary policy.
17	Monetary and Fiscal Policy Issues		<ul style="list-style-type: none"> • Learn about the recent issues in monetary policy and fiscal policy in Pakistan and internationally.
18	Final Exam		

ADVANCED ECONOMETRIC METHODS

Course Name	Advanced Econometric Methods (Core)	Prepared On	July 2017
Course Code	Eco 803		
Credit Hours	3		
Course Prereq. Name	NONE		
Course Prereq. Code		Revised On	

Course Type	Core Course					
Program	PhD Economics					
Semester						
Course Description						
Econometrics is an empirical application of various economics theories. The main objective of the course is to introduce the students about the advanced econometrics techniques and to prepare them to do their own applied work. In this course, will cover regression analyses and various estimation problems, qualitative analysis, ARCH and GARCH and simultaneous equation system. We will also cover various econometric issues, such as autocorrelation, multicollinearity and heteroskedasticity and their proper remedial measures. The use of various relevant softwares is also essential to accomplish the task.						
Course Learning Outcomes						
Sr.No.	Description					
<i>On completion of the course, Student will have following general understanding such as:</i>						
1	To lean and develop the basic econometrics concepts, with special focus on inferences and application in business education					
2	Construction and estimation of regression equation and its interpretation					
3	Understanding about various econometric issues and their proper remedial measures					
4	Computer applications of relevant various softwares, like EXCEL, SPSS, STATA and EVIEWS					
5	Broad overview of the subject and its applications					
Teaching & Learning Methodology						
As in previous courses						
Textbook(s)/ Reference Book(s)						
<ul style="list-style-type: none"> • Basic Econometrics, Gujarati D.N. and Proter D.C. 5th Edition, 2009. • Johnston, J. and J. Dinardo, Econometric Methods, (4th edition), McGraw-Hill, 1997 • Applied Econometrics, Asterio D. and Hall S. 2nd Edition, 2011. • Advanced Econometrics: A bridge to the literature, Greenberg Edward, March 1991. 						
Grading Policy						
As in previous courses						

WEEK-WISE COURSE OUTLINE		
Week	Contents/Description	Learning Outcomes
1	Introduction <ul style="list-style-type: none"> • Review of statistics and matrix algebra • An overview of Simple Regression Model 	<ul style="list-style-type: none"> • Understanding about Econometrics • Need and Importance of Econometrics • General applications
2	Structure of Economic Data <ul style="list-style-type: none"> • Time Series data • Cross Sectional data • Panel data • Data handling 	<ul style="list-style-type: none"> • Understanding about various forms of data Set • Working with data in software • Transformation of data
3	Classical Linear Regression Model <ul style="list-style-type: none"> • Nature of Simple Regression Analysis • Regression versus Correlation • Selected Examples/Exercise 	<ul style="list-style-type: none"> • Understanding about simple regression and correlation • Interpretation of results • Concept of Goodness of Fit • Performing a simple regression equation estimation by using various softwares
4	Regression Analysis: Estimation <ul style="list-style-type: none"> • Motivation for Multiple Regression Analysis • Interpretation of Results 	<ul style="list-style-type: none"> • Performing a multiple regression equation estimation by using various softwares

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> Determination of R Square and Adjusted R Square Selected Examples/Exercise 	<ul style="list-style-type: none"> Interpretation of empirical results Use of exercise in Business Education
5	<p>Regression Analysis: Inferences and Testing of Hypothesis</p> <ul style="list-style-type: none"> Hypothesis Testing Establishment of confidence interval Testing of Individual coefficients Testing of overall model Selected Example/Exercise 	<ul style="list-style-type: none"> Performing hypothesis testing procedure Formation of confidence interval Findings on the basis of Inferences Computer Applications
6	<p>Regression Analysis: Qualitative Data Analysis</p> <ul style="list-style-type: none"> Nature of Dummy Variable Regression Equation ANCOVA Models Selected Example/Exercise 	<ul style="list-style-type: none"> Understanding about nature of dummy variable regression equation Difference between ANOVA and ANCOVA models Interpretation of regression equation
7	<p>Multicollinearity</p> <ul style="list-style-type: none"> Multicollinearity and Its Consequences Detection of Multicollinearity Estimation in the presence of Multicollinearity 	<ul style="list-style-type: none"> Detecting the problem of Multicollinearity Distinguishing between perfect and imperfect multicollinearity Consequences in the presence of Multicollinearity
8	<p>Heteroskedasticity</p> <ul style="list-style-type: none"> Heteroskedasticity and Its Consequences Detection of Heteroskedasticity Estimation in the presence of Heteroskedasticity 	<ul style="list-style-type: none"> Recognizing the problem of Heteroskedasticity OLS estimation in the presence of Heteroskedasticity Consequences in the presence of Heteroskedasticity
9	Mid Term Exam	
10	<p>Autocorrelation</p> <ul style="list-style-type: none"> Autocorrelation and Its causes First and Higher order autocorrelation Detection and Resolving of Autocorrelation 	<ul style="list-style-type: none"> Understanding about autocorrelation What causes of autocorrelation? Detection and remedial measures of autocorrelation
11	<p>Non Linear Regression Models</p> <ul style="list-style-type: none"> Estimation of Linear and Nonlinear regression model Trial and Error Method Illustrative Examples 	<ul style="list-style-type: none"> Understanding about Linear and Nonlinear models Application of Nonlinear models
12	<p>Qualitative Response Regression Models</p> <ul style="list-style-type: none"> Nature of the Model Linear Probability Model (LPM) The Logit Model (Alternative to LPM) Illustrative Examples 	<ul style="list-style-type: none"> Understanding of LPM and Logit Models Applications of LPM
13	<p>Qualitative Response Regression Models</p> <ul style="list-style-type: none"> The Probit Model and its Nature Probit Estimation with grouped data Tobit Model and Its estimation Illustrative Examples 	<ul style="list-style-type: none"> Nature of Probit and Tobit Model Estimation and Interpretation of Logit, Probit and Tobit Models
14	<p>Simultaneous Equation Models</p> <ul style="list-style-type: none"> Nature of Simultaneous Equation 	<ul style="list-style-type: none"> Identifying nature of Simultaneous Equation

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> • Estimation the Equation • Illustrative Examples 	<ul style="list-style-type: none"> • Estimation of Equation and its interpretation
15	Time Series Econometrics: Introductory <ul style="list-style-type: none"> • ARCH Models • GARCH Models • Illustrative Examples 	<ul style="list-style-type: none"> • Nature of ARCH-GARCH models • Measuring ARCH and GARCH Models • Empirical Illustration of ARCH-GARCH Models
16	Time Series Econometrics: Advanced <ul style="list-style-type: none"> • VAR Models • Causality Tests • Cointegration and ECM • Illustrative Examples 	<ul style="list-style-type: none"> • Nature of VAR Model and its application • Granger causality test • Application in Financial development and economic growth
17	Panel Data Econometrics: Traditional and Dynamic Analysis <ul style="list-style-type: none"> • Traditional panel data models • Advantages of panel data • Fixed/Random effects models • Illustrative Examples 	<ul style="list-style-type: none"> • Understanding about panel data models • Linear panel model • Recognizing the importance of fixed and random effect models • Application/Interpretation of equation
18	Final Exam	

AGRICULTURAL DEVELOPMENT & POLICY

Course Name	Agricultural Development & Policy	Prepared On	July 2017					
Course Code	ECO 810							
Credit Hours	3							
Course Prereq. Name	Nil							
Course Prereq. Code								
Course Type	Elective Course	Revised On						
Program	PhD Economics							
Semester								
Course Description								
This course is comprehensive look at agricultural development policy. It provides a clear, systematic review of important classes of policy issues in developing countries and discusses the emerging international consensus on viable approaches to the issues. It will include the following: Review of Agricultural System and Policies in Pakistan, Agricultural supply topics including: Product and Factor Prices, Analysis of Policy Options, Price Support and Input Subsidies, Price Policy and Adoption of New Technologies, Interrelated Commodities, Water Pricing and Project Evaluation Principles as applicable to Third World Countries.								
Course Learning Outcomes								
Sr.No.	Description							
<i>On completion of the course, Student will have following general understanding such as:</i>								
1	Learn about the framework of agricultural policy							
2	Learn about the tools of agricultural policy							
3	Learn about issues in agriculture policy							
4	Learn about land policies and water management							
5	Learn about the agricultural policy in Pakistan and its issues							
Teaching & Learning Methodology								
As in previous courses								
Textbook(s)/ Reference Book(s)								

1. Colman D., Young T. Principles of agricultural economics: Markets and prices in less Developed Countries, Cambridge University Press, Cambridge, 1989. (Text)
2. Agricultural Development Policy: Concepts and Experiences, Roger D. Norton
3. Kenneth L. Casavant, Craig L. I. and Deborah E. Bridges, Agricultural Economics and Management, 1999, Prentice Hall.
4. Ellis F. Peasants economics: Farm households and agrarian development, Cambridge University Press, 1988.
5. Capstick Margret. The Economics of Agriculture, London George Allen Unwin Ltd. latest edition.
6. Chaudhary M. Aslam, Agricultural Development and Public Policies, Izhar Sons, Lahore, 1989.
7. Ghatak S., and Ingersent K., Agriculture and Economic Development, (Latest Edition), Harvester Press.
8. Johnston, Bruce, F & Fellir Kily. Agricultural and Structural Transformation, Economic Strategies in late Developing Countries.

Grading Policy

As in previous courses

WEEK-WISE COURSE OUTLINE

Week	Contents/Description	Learning Outcomes
1	Introduction: What is agricultural policy? Basic Considerations	<ul style="list-style-type: none"> • Learn about agriculture economics • Get exposed to world statistics and facts on agriculture economics • Learn about agricultural sector and economic growth • Learn about agricultural growth and poverty reduction
2	Strategies and Agricultural policy frame work	<ul style="list-style-type: none"> • Learn about strategies and policies • Learn about the nature of policy instruments • Learn about the objectives of agriculture policy • Learn about the role of government • Learn about the implementation of strategies and policies
3	Issues of Agriculture Policy (1)	<ul style="list-style-type: none"> • Learn about macroeconomic framework and agriculture policy • Learn about fiscal expenditures and subsidies
4	Issues of Agriculture Policy (2)	<ul style="list-style-type: none"> • Learn about how to improve incomes of the rural poor • Learn about the role of gender
5	Policies that influence produce incentives	<ul style="list-style-type: none"> • Learn about the model • Learn about prices and their determinants • Learn about trade policy
6	Policies that influence produce incentives: Fiscal Policy and Agriculture	<ul style="list-style-type: none"> • Learn about exchange rate policy and implications • Learn about macroeconomic policy Options for agriculture • Learn about sectorial policies that influence prices • Learn about food security • Learn about observations on price stabilization and agriculture development
7	Land Tenure Policies (1)	<ul style="list-style-type: none"> • Learn the Importance of Land Tenure

WEEK-WISE COURSE OUTLINE		
		<ul style="list-style-type: none"> • Learn about the objectives of Land Tenure Policies • Learn about Issues and Trends concerning Land Tenure • Learn about the Nature of Land Rights
8	Land Tenure Policies (2)	<ul style="list-style-type: none"> • Learn about communal, collective and individual rights to land • Get exposed to experiences with land reform • Learn about policies for land markets • Learn about improving access to Land for the Poor and for Women
9	Mid term exam	
10	Models for the Analysis of Food Security and Sustainable Agriculture	<ul style="list-style-type: none"> • Learn about the Policy Objectives for the Irrigation Sector • Get exposed to Strategic Planning for Irrigation as Part of Water Resource Management • Get exposed to strategic Issues in Irrigation Development • Learn about principal policy issues in the irrigation • Learn about institutional and process issues in water management • Learn about the role of Irrigation as a Tool of Rural Development
11	Policies for Agricultural Technology	<ul style="list-style-type: none"> • Learn about the Role and Context of Agricultural Technology • Get exposed to issues in Agricultural Research • Learn about issues in Agricultural Extension • Learn about new approaches to Agricultural Extension
12	Agricultural Development Strategies: Process	<ul style="list-style-type: none"> • Get exposed to the Roles of an Agricultural Strategy • Learn about Participatory Processes for Developing Strategies
13	Agricultural Development Strategies: Structure	<ul style="list-style-type: none"> • Learn about Structure and Consistency in a Strategy • Learn about substantive Orientations of an Agricultural Strategy • Rural Development and Poverty Alleviation • Implementation of a Strategy
14	Agricultural supply topics including: Product and Factor Prices, applicable to Third World Countries.	<ul style="list-style-type: none"> • Learn about policy options • Learn about subsidies and price support • Learn about price policy and impact of new technology adoption
15	Analysis of Policy Options & Water	<ul style="list-style-type: none"> • Learn about price support and input subsidies • Learn about advantages of New technologies • Learn about interrelated commodities • Learn about Pricing and Project Evaluation Principles in the case of water management

WEEK-WISE COURSE OUTLINE			
16	Review of Agricultural System and Policies in Pakistan	<ul style="list-style-type: none"> • Learn about the agriculture system and policies in place in Pakistan • Learn about the case of India and America for comparison purposes 	
17	Revision		
18	Final Exam		

DEVELOPMENT ECONOMICS

Course Name	Development Economics (Elective)	Prepared On	July 2017			
Course Code	ECO 820					
Credit Hours	3					
Course Prereq. Name	Applied Macroeconomics Theory					
Course Prereq. Code	ECO 802, ECO 870	Revised On				
Course Type	Elective Course					
Program	PhD Economics					
Semester						
Course Description						
This is an advanced course in Development Economics. This course emphasizes dynamic models of growth and development. Topics covered include: migration, modernization, and technological change; static and dynamic models of political economy; the dynamics of income distribution and institutional change; firm structure in developing countries; development, transparency, and functioning of financial markets; privatization; and banks and credit market institutions in emerging markets.						
Course Learning Outcomes						
Sr.No.	Description					
<i>On completion of the course, Student will have following general understanding such as:</i>						
1	Learn about dynamic models of growth and development					
2	Learn about general equilibrium modeling					
3	Learn about quantifying the impact of financial development on economic development					
4	Learn about tools of measurement for development					
Teaching & Learning Methodology						
As in previous courses						
Textbook(s)/ Reference Book(s)						
<ul style="list-style-type: none"> • Development microeconomics by Pranab Bardhan and Christopher Udry. (Oxford, Oxford University Press, 1999, pp. 242). 						
Grading Policy						
As in previous courses						

WEEK-WISE COURSE OUTLINE

Week	Contents/Description	Learning Outcomes
1	Introduction to the course Finance Growth and Volatiles	<ul style="list-style-type: none"> • Learn about sources of volatility • Learn about the relationship between with level of development and volatility • Learn why poor countries are and remain volatile • Learn about First Generation Quantitative Models
2	General Equilibrium Modeling with Financial Frictions <ul style="list-style-type: none"> • Occupational Choice and limited commitment-theory 	<ul style="list-style-type: none"> • Learn about Micro Founded Macro Models • Learn about DSGE with financial sector (DSGE: Greenwood-Jovanovic)

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> • Risk-sharing, insurance and financial deepening • Model Comparison 	<ul style="list-style-type: none"> • Learn about growth and inequality • Learn about LEB model and GJ Model.
3	Growth, TFP, And Inequality With Financial Market Imperfections (1)	<ul style="list-style-type: none"> • Learn about transitions rather than steady state growth. • Learn about cross country and sector evidence on growth. • Learn about the importance of transition and reconciling cross country evidence. • Learn about how TFP differences explain growth • Learn about how scale differences effects help in understanding the impact of financial frictions on sectorial productivity.
4	Growth, TFP, And Inequality With Financial Market Imperfections (2)	<ul style="list-style-type: none"> • Learn about transitions rather than steady state growth. • Learn about cross country and sector evidence on growth. • Learn about the importance of transition and reconciling cross country evidence. • Learn about how TFP differences explain growth • Learn about how scale differences effects help in understanding the impact of financial frictions on sectorial productivity.
5	International Capital Flows with Other Frictions in Financial Intermediation	<ul style="list-style-type: none"> • Learn about quantifying the impact of financial development on economic development • Learn how Financial frictions can be used to explain the run-up to the financial crisis of 2007
6	Limited Commitment vs. Moral Hazard (1)	<ul style="list-style-type: none"> • Develop a general equilibrium model of entrepreneurship and financial frictions that is general enough to encompass: • (1) financial frictions stemming from limited commitment. • (2) financial frictions stemming from private information (moral hazard). • (3) Mixtures of different regimes in different regions
7	Limited Commitment vs. Moral Hazard (2)	<ul style="list-style-type: none"> • Develop a general equilibrium model of entrepreneurship and financial frictions that is general enough to encompass: • (1) financial frictions stemming from limited commitment. • (2) financial frictions stemming from private information (moral hazard). • (3) Mixtures of different regimes in different regions • Learn about implications
8	Measurement in Development Economics	<ul style="list-style-type: none"> • Learn about tools of measurement • Learn about Problems with measurement • Learn asset & liability management • Learn about flow of funds account
9	Mid Term Exam	
10	Insurance	<ul style="list-style-type: none"> • Learn about risk and insurance • Learn about the effectiveness of financial institutions

WEEK-WISE COURSE OUTLINE		
		<ul style="list-style-type: none"> • Learn about the role of informal finance • Learn about intervention and welfare • Learn about lessons from real interventions from the past
11	Capital Asset Pricing	<ul style="list-style-type: none"> • Learn about a model to study risk and return of household's productive assets in developing economies • Learn about Application • Learn how to Measure risk-adjusted return and use it to analyze productivity of assets of household enterprises
12	Consumption Smoothing and Risk Sharing	<ul style="list-style-type: none"> • The student will review models of consumption smoothing and insurance • Learn about the SIM model and its implications
13	Labor and Development	<ul style="list-style-type: none"> • Learn about wage risk • Learn to model an economy where workforce heterogeneity stems from idiosyncratic productivity shocks
14	Evaluation of a Large Scale Microfinance Experiment	<ul style="list-style-type: none"> • Learn about the impact of a large-scale microfinance quasi-experiment • Learn how to use a reduced-form IV and structural analysis in complementary fashion • Learn about the strengths and weaknesses of each approach
15	Financial infrastructure and the impact of expansion	<ul style="list-style-type: none"> • Learn about limitations of reduced-form and IV analysis • Learn about the importance of heterogeneity in evaluating microfinance programs
16	Seminal Papers Review	<ul style="list-style-type: none"> • The students will review papers on development economics to help foster understanding of development economics research areas
17	Revision	
18	Final Exam	

ECONOMIC GROWTH AND DISTRIBUTION

Course Name	Economic Growth and Distribution (Elective)	Prepared On	July 2017		
Course Code	ECO 830				
Credit Hours	3				
Course Prereq. Name	Applied Macroeconomics Theory, Mathematical Economics				
Course Prereq. Code	ECO 802, ECO 870	Revised On			
Course Type	Elective Course				
Program	PhD Economics				
Semester					
Course Description					
This course is a course on advanced macroeconomic modelling focusing on economic growth. It will focus both on models of economic growth and their empirical applications, and try to shed light on the mechanics of economic growth, technological change and sources of income and growth differences across countries.					
Course Learning Outcomes					

Sr.No.	Description
<i>On completion of the course, Student will have following general understanding such as:</i>	
1	Familiarize students with a set of issues and questions that are central to macroeconomics,
2	Introduction to some of the key empirical issues in economic growth
3	Develop important tools of dynamic economics useful in macroeconomics as well as in a number of other subdisciplines of economics including general equilibrium theory, political economy, industrial organization and contract theory
4	Be able to develop macroeconomic growth models.
Teaching & Learning Methodology	
As in previous courses	
Textbook(s)/ Reference Book(s)	
<ul style="list-style-type: none"> Acemoglu, Daron. Introduction to Modern Economic Growth. Princeton University Press, 2009. ISBN: 9780691132921. Romer, D. (1996), Advanced Macroeconomics, McGraw-Hill. 	
Grading Policy	
As in previous courses	

WEEK-WISE COURSE OUTLINE		
Week	Contents/Description	Learning Outcomes
1	Introduction <ul style="list-style-type: none"> Stylized facts on Economic Development Fundamental Causes of Economic Development 	<ul style="list-style-type: none"> Show Disparity in Cross Country Per Capita Income Help establish how to investigate relationship between economic growth and country specific characteristics discuss briefly how the world distribution of income across countries has come to be so unequal
2	Introduction to the Solow Growth Model (Week 1) <ul style="list-style-type: none"> Modelling of the Solow Growth Model 	<ul style="list-style-type: none"> Learn the Basics of the Solow Model Learn how to mathematically model the Solow model
3	Introduction to the Solow Growth Model (Week 2) <ul style="list-style-type: none"> Modelling of the Solow Growth Model 	<ul style="list-style-type: none"> Learn the Basics of the Solow Model Learn how to mathematically model the Solow model
4	The Solow Model and the Data; Growth Accounting, Levels Accounting, and the Facts	<ul style="list-style-type: none"> Learn how to use Solow Model to interpret 1st Lecture facts on growth Learn empirical strategies and methodologies used in cross country studies for growth accounting
5	Neoclassical Growth – Week 1 <ul style="list-style-type: none"> Incorporating Consumer Optimization 	<ul style="list-style-type: none"> Learn fundamentals of consumer optimization in dynamic economics learn about the assumption of representative households learn about equilibria and Pareto optimal allocation of neoclassical model
6	Neoclassical Growth – Week 2 <ul style="list-style-type: none"> Incorporating Consumer Optimization 	<ul style="list-style-type: none"> learn about the steady state of equilibrium learn about the dynamic equilibrium path of economy Learn how to characterize both the steady state equilibrium and dynamic equilibrium path of

WEEK-WISE COURSE OUTLINE		
		economy starting from an arbitrary level of capital stock.
7	Overlapping Generations and Dynamic Efficiency (1) <ul style="list-style-type: none"> • Welfare theorems in dynamic economies • Overlapping Generations model 	<ul style="list-style-type: none"> • Learn about the first and second welfare theorems in dynamic economies • Learn the modeling of Overlapping Generations model
8	Overlapping Generations and Dynamic Efficiency (2) <ul style="list-style-type: none"> • Dynamic inefficiency in overlapping generations model • Application of Overlapping Generations Model 	<ul style="list-style-type: none"> • Learn about the sources and conditions for dynamic inefficiency in overlapping generations model • Learn about applications of model
9	Mid Term Exam	
10	Neoclassical endogenous Growth (1) <ul style="list-style-type: none"> • Capital Accumulation • Externalities • Human Capital 	<ul style="list-style-type: none"> • Learn about sustain growth modeling • Learn how to incorporate endogenous growth due to technology growth • Learn issues in modelling economic growth with externalities. • Learn issues in modelling technological change • Learn the role of human capital in economic growth • introduce basic models that are useful in regards to human capital investments
11	Neoclassical endogenous Growth (2) <ul style="list-style-type: none"> • Capital Accumulation • Externalities • Human Capital 	<ul style="list-style-type: none"> • Learn about sustain growth modeling • Learn how to incorporate endogenous growth due to technology growth • Learn issues in modelling economic growth with externalities. • Learn issues in modelling technological change • Learn the role of human capital in economic growth • introduce basic models that are useful in regards to human capital investments
12	Endogenous growth with expanding input varieties (1) <ul style="list-style-type: none"> • Modeling growth with R&D • Knowledge spillovers • Externalities 	<ul style="list-style-type: none"> • Learn how to model endogenous technological change with growth taking place due to R&D • Learn about evidence on knowledge spillovers and innovation
13	Endogenous growth with expanding input varieties (2) <ul style="list-style-type: none"> • Modeling growth with R&D • Knowledge spillovers • Externalities 	<ul style="list-style-type: none"> • Learn how to model endogenous technological change with growth taking place due to R&D • Learn about evidence on knowledge spillovers and innovation
14	Interdependences <ul style="list-style-type: none"> • Technology Diffusion, • Trade and the World Income Distribution in an Open Economy 	<ul style="list-style-type: none"> • Learn about major interdependences across countries due to technology and international trade. • Learn how the interdependencies affect economic growth

WEEK-WISE COURSE OUTLINE		
		<ul style="list-style-type: none"> • Learn how interdependencies affect world income distribution
15	Models of Directed Technical Change <ul style="list-style-type: none"> • Direction of technical change • Skill bias • Labor augmenting 	<ul style="list-style-type: none"> • Learn about models with endogenous direction of technological change • Learn about how and when technological change maybe skill biases • Learn about why technological change may be expected to be labor augmenting.
16	Competition and Technological Change	<ul style="list-style-type: none"> • Learn about the relationship between competition and technological change • Interpret evidence regarding the relationship
17	Final Exam	

ECONOMICS OF POPULATION

Course Name	Economics of Population	Prepared On	July 2017			
Course Code	ECO 840					
Credit Hours	3					
Course Prereq. Name	NONE					
Course Prereq. Code		Revised On				
Course Type	Elective Course					
Program	Ph.D Economics					
Semester		Course Description				
<p>This is an advance-level course in Economics of labor and Population. It is designed for post-graduates who wants to study environmental economics concerns with an interdisciplinary focus. The course will introduce students to the analysis of the economic consequences of demographic change; emphasis will be placed on analytical techniques drawn from demography as well as economics. It will help students to learn about how individuals and households make important life decisions, in particular:</p> <p>i) Investment in one's own human capital, ii) Interaction tactics with the labor market, and iii) Decision analysis of living with whom and where; and its impact on one's income, wealth, health, happiness and other measures of wellbeing. These are the core decisions studied in population and labor economics. The course will discuss examples from both developed and developing countries to give students a well-rounded introduction to the literature in this broad research area.</p>						
<p>Course Learning Outcomes</p> <p>This course is aimed at highlighting the use of population interaction and decision making in economics. The main objective of the study of this course is for students to learn about how individuals and households make important life decisions, in particular:</p> <p>i) how much to invest in one's own human capital, ii) how and whether to interact with the labor market, and iii) how to decide where to live and with whom to interact; and what impact these decisions have on one's income, wealth, health, happiness and other measures of wellbeing. These are the core decisions studied in labor and population economics. iv) The other objective is for students to learn about both classic research papers of fundamental importance and recent cutting edge research on the topics discussed.</p>						
<p>Teaching & Learning Methodology</p> <p>As in previous courses</p>						
<p>Textbook(s)/ Reference Book(s)</p>						

- G.J. Borjas Labor Economics (3rd ed. McGraw Hill)
- Cahuc, P. and Zylberberg, A. (2004) Labor Economics, MIT Press, Cambridge, MA.
- Handbook of Labor Economics. The latest volumes are volumes 3a, 3b and 3c edited by O. Ashenfelter and D. Card (North-Holland, 1999).
- Wooldridge, J.M. (2010): Econometric Analysis of Cross Section and Panel Data, 2nd edition, MIT Press, Cambridge, MA.
- Wooldridge, J.M. (2003): Introductory Econometrics: A Modern Approach, 2nd edition, South-Western Publishing, Cincinnati, OH,

Grading Policy

As in previous courses

WEEK-WISE COURSE OUTLINE

Week	Contents/Description	Learning Outcomes
1	<p>Introduction</p> <ul style="list-style-type: none"> • An Introduction to population Economics, the Fundamentals of Good Research, and the Meaning and Methods of Causal Analysis • Empirical Methods and Modelling Strategies for Causal Analysis 	<ul style="list-style-type: none"> • Labor behavior • importance of labor economics • Understanding about Meaning and Methods of Causal Analysis
2	<p>DEMOGRAPHIC BACKGROUND AND ANALYSES</p> <ul style="list-style-type: none"> • Introduction about demo-graphs of population • Analysis of demography and solution to various economic and consumer problems 	<ul style="list-style-type: none"> • Application of demographic background • Analysis of demography and its economic solutions
3	<p>DEMOGRAPHIC BACKGROUND AND ANALYSES</p> <ul style="list-style-type: none"> • Implications of population change for government expenditures and support ratios 	<ul style="list-style-type: none"> • Learn about how government expenditure increase with the population
4	<ul style="list-style-type: none"> • DEMOGRAPHIC CHANGE AND THE MACROECONOMY • A Simulation Analysis of the Effects of Population Change • Demographic Trends, Labor Force Participation, and Long-Term Growth,” • Population Aging, Productivity and Living Standards 	<ul style="list-style-type: none"> • Application of simultaneous analysis, demographic trends, population aging, living standards and labor productivity
5	<p>Human Capital and Income distribution</p> <ul style="list-style-type: none"> • Human Capital and Earnings Profiles: Why Should I Go To School? • Does School Quality Matter: Where Should I Go To School? • Peer Effects: Who Should I Be Friends With? 	<ul style="list-style-type: none"> • Understanding about human capital and income distribution. Its relationship with education and societal interaction
6	<p>Labor Supply and Demand:</p> <ul style="list-style-type: none"> • Why Should I Work? • Labour Supply: Impact of Public Policies on Work Decisions 	<ul style="list-style-type: none"> • The student will learn about the interaction of labor supply and demand and its impact on the public policies
7	<p>Labor Supply and Demand</p> <ul style="list-style-type: none"> • Group Differences in Labour Market Outcomes: Why Do Some People Earn More Than Others? • Inequality and Changes in the Wage Structure: How Does the Labour Market Evolve Over Time? 	<ul style="list-style-type: none"> • The student will learn about the income inequality and changes in the Wage Structure

WEEK-WISE COURSE OUTLINE			
8	REVISION WEEK		
9	MID TERM EXAM		
10	Aging and optimal public saving in a neo-classical economy <ul style="list-style-type: none"> • Ramsey framework • Ratio of capital to worker • Optimal saving rate (through fiscal policy). • The social planner utility function and the constraint (intuitions and realism) • The Analysis of Household Surveys 		<ul style="list-style-type: none"> • The student will learn about the application of Ramsey framework. • The relationship between worker, capital and income.
11	Aging and health <ul style="list-style-type: none"> • Quantifying health at the population level • Problems and solutions in calculating quality-adjusted life years (QALYs) 		<ul style="list-style-type: none"> • Understanding about the problems and solutions of health for population and their respective solutions for the problems
12	Aging and health <ul style="list-style-type: none"> • Health Expenditure Growth: Reassessing the Threat of Ageing 		<ul style="list-style-type: none"> • Understanding about the threats and assurances of aging in an economy
13	Labor Market and decision-making <ul style="list-style-type: none"> • Intra-household Decision-Making and Resource Allocation • Labor Market, Industrial and Labor Relations 		<ul style="list-style-type: none"> • Understanding the decision making analysis of a household
14	Labor Market and decision-making <ul style="list-style-type: none"> • Location and labor Markets: Where Should I Live? • Migrations and the wage rate 		<ul style="list-style-type: none"> • Understanding about behavior of labor markets and their decision about migration and profitable wage rate
15	The Economics of Fertility <ul style="list-style-type: none"> • Work, Family and Child Development • The Economics of Fertility 		<ul style="list-style-type: none"> • Learn about the economics of fertility and its relationship with work, family and child development • Learn about the economics of fertility and its relationship with work, family and child development
16	TERM PAPER PRESENTATION		
17	REVISION WEEK		
18	FINAL EXAM		

ENVIRONMENTAL ECONOMIC

Course Name	Environmental Economics	Prepared On	July 2017
Course Code	ECO- 850		
Credit Hours	3		
Course Prereq. Name	Applied Microeconomics Theory & Applied Macroeconomics Theory		
Course Prereq. Code	ECO-801 ECO-802	Revised On	
Course Type	<input type="checkbox"/> Core Course <input type="checkbox"/> Elective		
Program	<input type="checkbox"/> Ph.D Economics		
Semester	2		
Course Description			

This is an advance-level course in environmental economics. It is designed for post-graduates who wants to study environmental economics concerns with an interdisciplinary focus. More specifically, the course attempts to incorporate advanced ideologies of both microeconomics and ecology that are essential for a comprehensive understanding and critical assessment of the human's historical struggles to "coexist" with the natural environment. These ecological and economic principles are also used to shed light on some contemporary and controversial environmental policy issues.

Right from the outset it should be understood that this course is not aimed at a study of a specific environmental issue. Instead, the course intends to delve into the theoretical underpinnings that are critical to a clear understanding of most contemporary environmental and natural resource problems. Thus, the emphasis is on a systematic development of theoretical principles and conceptual frameworks essential for a comprehensive analysis of environmental and natural resource issues and the assessments of alternative environmental policy instruments, in general.

Course Learning Outcomes: By the end of the course students would be able to achieve following outcomes.

CLO	Description
1	After succeeding this course, students are able to illustrate the most important interactions between the economy and the environment, and their relationship with sustainable development.
2	They will be able to explain why, and under which conditions, the free market does not result in an efficient outcome.
3	They will be capable of showing how externalities can be 'internalized' by using market instruments, like taxes, quotas and tradable permits, etc.
4	They will be able to evaluate and advise environmental policy makers on which policy instruments to use under different circumstances

Teaching & Learning Methodology

To make the teaching heuristic, class-room sessions will be based on lectures, group activities, role plays, case studies, article presentations, team activities and group discussions. Students are expected to participate positively in all such exercises/activities as they all will be considered as marked assignment.

Textbook(s) / Reading Material

- Kolstad, Charles. *Environmental Economics*. 2nd ed. Oxford University Press, 2010.
- Environmental Economics, An Introduction, by Barry C. Field & Martha K. Field

Reference Book(s)

- Ecological Economics, Principles and Applications, by Herman. E. Daly and Joshua Farley
- Economics of Natural Recourses and the Environmental by David W. Pearce & R. Kerry Turner
- Natural Recourse and Environmental Economics, 3rd Edition, by Roger Preman, Yue Ma, James McGilvray & Michael Common
- Principles of Environmental Economics by Ahmed Hussen.

Research Articles from Journals indexed by Thomson Reuters.

Research Articles from News Paper

Grading Policy

As in previous courses

Week-wise Course Outline

	Topics	Learning Outcomes	

Week 1	Introduction to Environmental Economics	The concepts of efficiency, optimality and sustainability. Learn about the history of natural resource and environmental economics Have the main issues of modern resource and environmental economics identified	
Week 2	The Problem of sustainability; Source of environmental science Environmental Pollution & Technology Human economic development	Student will learn how economic activity depends upon and affects the natural environment be introduced to some basic material from the environmental sciences Learn about the proximate drivers of the economy's impact on the environment – population, affluence and technology Review the current state of human economic development and limits to economic growth	
Week 3	Concepts of sustainability Hartwick Rule Incentives of Sustainability	Introduced to concepts of sustainability Learn about the importance of substitution possibilities in considerations of whether constant consumption is feasible Have the distinction between 'weak' and 'strong' sustainability explained Find out when and how the Hartwick rule works learn about incentives and information in relation to sustainability	
Week 4	Welfare economics and the environment: Efficiency and optimality An efficient allocation Market failure	In this lecture student will Learn about the concepts of efficiency and optimality in allocation Derive the conditions that are necessary for the realization of an efficient allocation Find out about the circumstances in which a system of markets will allocate efficiently Learn about market failure and the basis for government intervention to correct it find out what a public good is, and how to determine how much of it the government should supply Learn about pollution as an external effect, and the means for dealing with pollution problems of different kinds	
Week 5	Pollution control: targets & Instruments: Concept of a pollution Alternative policy for Pollution targets Flow and stock pollutants The role of spatial differentiation for emissions targets	Quiz 1 At the end of this lecture, the student should be able to Understand the concept of a pollution target n appreciate that many different criteria can be used to determine pollution targets Understand that alternative policy objectives usually imply different pollution targets Understand how in principle targets may be constructed using an economic efficiency criterion Understand the difference between flow and stock pollutants. Analyze efficient levels of flow	

		<p>pollutants and stock pollutants appreciate the importance of the degree of mixing of a pollutant stock</p> <p>Recognize and understand the role of spatial differentiation for emissions targets. How bargaining processes might bring about efficient resource allocations (and so might lead to the attainment of efficient pollution outcomes without regulatory intervention) n the conditions which limit the likelihood of bargaining solutions to pollution problems being achieved n the instruments available to attain a pollution target n the mechanisms by which pollution instruments operate in attaining targets n the comparative merits of alternative instruments n the significance, in instrument choice, of whether a pollutant is uniformly mixing</p>	
Week 6	Pollution policy with imperfect information	<p>Assignment 2</p> <p>Having understand this lecture, the student should be able to</p> <p>Distinguish between uncertainty about pollution abatement costs and pollution damages</p> <p>Understand the concept of efficiency losses arising from making decisions under conditions of uncertainty</p> <p>Analyze how the choice of pollution control instrument might depend on the relative slopes of control cost and damage functions, and so discuss the comparative merits of alternative instruments</p> <p>Appreciate some of the implications of nonlinearity or threshold effects in emissions damage functions for pollution control programs</p>	
Week 7	Economy-wide modelling: Input-output Analysis computable general equilibrium (CGE) models and their application	<p>In this lecture student will</p> <p>Learn about the basic input–output model of an economy and its solution.</p> <p>Find out how the basic input–output model can be extended to incorporate economy–environment interactions.</p> <p>Learn how the input–output models, specified in terms of physical or constant-value flows, can be reformulated to analyse the cost and price implications of environmental policies, such as pollution taxes, and how these results can be used to investigate the distributional implications of such policies.</p> <p>Study the nature of computable general equilibrium (CGE) models and their application to environmental problems</p>	
Week 8	Revision for exams		
Week 9	Mid Term Exam (Subject to Change)		

Week 10	International environmental problems Game Theory International Cooperation	The student should understand the implications of these questions, In which ways do international environmental problems differ from purely national (or subnational) problems? What additional issues are brought into contention by virtue of an environmental problem being 'international'? What insights does the body of knowledge known as game theory bring to our understanding of international environmental policy? What determines the degree to which cooperation takes place between countries and policy is coordinated? Put another way, which conditions favour (or discourage) the likelihood and extent of cooperation between countries?	
Week 11	Cost–benefit analysis.	Quiz 2 In this lecture student will Learn about the conditions necessary for intertemporal efficiency. Find out how to do project appraisal n learn about cost–benefit analysis and its application to the environment. Introduced to some alternatives to cost–benefit analysis	
Week 12	Valuing the environment Categories of economic value assigned Use and non-use values The utility theory Travel Cost Method	In this lecture student will Learn about the categories of economic value assigned to the natural environment, and the distinction between use and non-use values. Work through the utility theory on which environmental valuation techniques are based Find out how the Travel Cost Method uses data on actual behaviour to infer use value Learn about the ways in which the Contingent Valuation Method generates and uses data which are individuals' responses to hypothetical questions to infer non-use value Be introduced to some of the controversies about the Contingent Valuation Method Find out about Choice Modelling as an alternative to Contingent Valuation Learn about Hedonic Pricing for valuing pollution. Be introduced to valuation methods that are based on production function analysis	
Week 13	The efficient and optimal use of natural resources Concepts of efficiency and optimality Optimal growth Models	Assignment 3 Understand the ideas of 'efficient' and 'optimal' allocations of environmental resources. Recognize the relationship between – but also the difference between – the concepts of efficiency and optimality	

		<p>Understand how questions relating to efficient and optimal use of environmental resources over time can be analysed using a class of models known as 'optimal growth models'. Appreciate the ways in which resource use patterns are linked with sustainability</p>	
Week 14	<p>The theory of optimal resource extraction: non-renewable resources</p> <p>Resource substitution possibilities</p> <p>Models of optimal resource depletion.</p> <p>Dynamic analysis of resource depletion models</p> <p>Consequences of taxes and subsidies</p>	<p>The student should be able to understand the concept of non-renewable resources. Appreciate the distinctions between alternative measures of resource stock, such as base resource, resource potential and resource reserves.</p> <p>Understand the role of resource substitution possibilities and the ideas of a backstop technology and a resource choke price.</p> <p>Construct and solve simple discrete time and continuous time models of optimal resource depletion.</p> <p>Understand the meaning of a socially optimal depletion programme, and why this may differ from privately optimal programs.</p> <p>Carry out simple comparative dynamic analysis in the context of resource depletion models, and thereby determine the consequences of changes in interest rates, known stock size, demand, price of backstop technology, and resource extraction costs.</p> <p>Compare resource depletion outcomes in Competitive and monopolistic markets.</p> <p>Identify the consequences of taxes and subsidies on resource net prices and resource revenues.</p> <p>Understand the concept of natural resource scarcity, and be aware of a variety of possible measures of scarcity</p>	
Week 15	<p>Stock pollution problems:</p> <p>Models of optimal emissions</p> <p>Aggregate stock pollution model</p> <p>Model of waste accumulation</p>	<p>Quiz 3</p> <p>In this lecture student will</p> <p>Investigate two models of optimal emissions which are suitable for the analysis of persistent (long-lasting) pollutants. Each of these models is a variant of the optimal growth model framework.</p> <p>Investigate a simple 'aggregate stock pollution model'. This model is appropriate for dealing with pollution problems where the researcher considers it appropriate to link emissions flows to the processes of resource extraction and use.</p>	

		Use the aggregate stock pollution model to identify how optimal pollution targets can be obtained from generalized versions of the resource depletion models Learn about the ‘model of waste accumulation and disposal’ – provides a framework that is suitable for analyzing stock pollution problems of a local, or less pervasive type.	
Week 16	Renewable resources: Biological growth function sustainable yield Bio-economic equilibrium outcome Comparative statics analysis Project Presentation	After this lecture, the student should be able to Understand the biological growth function of a renewable resource, and the notions of compensation and dispensation in growth processes. Interpret the simple logistic growth model, and some of its variants, including models with critical dispensation. Understand the idea of a sustainable yield and the maximum sustainable yield n distinguish between steady-state outcomes and dynamic adjustment processes that may (or may not) lead to a steady-state outcome. Specify, and solve for its bio-economic equilibrium outcome, an open-access fishery, a static private property fishery, and a present value (PV)-maximizing fishery. Undertake comparative statics analysis and simple dynamic analysis for open-access and private property models.	
Week 17	PROJECT PRESENTATION & REVISION FOR FINAL EXAM		
Week 18	FINAL EXAM		

INTERNATIONAL ECONOMICS

Course Name	International Economics	Prepared On	July 2017
Course Code	ECO-860		
Credit Hours	3		
Course Prereq. Name	NONE		
Course Prereq. Code		Revised On	
Course Type	Elective		
Program	Ph.D Economics		
Semester	1		
Course Description	This is a one semester course in international trade, theory and policy. The course will aim to explain patterns of world production and trade and ask if international trade is beneficial. This will be done with		

the help of models from international trade theory that are important components of the toolkit of contemporary trade economists. The course will also explore the phenomena of outsourcing and international mobility of labor (immigration) and capital (Foreign Direct Investment (FDI)). The course will analyze and compare instruments of trade policy and evaluate their impact on domestic and international welfare. Finally, the course will study the world trading system, including the World Trade Organization (WTO) and international trade agreements

Course Learning Outcomes

This course is aimed at highlighting the use of International economics in Trade decision. The main objective of the study of this course is to enhance the students' knowledge about:

- Understand the major models of international trade and compare and contrast them.
- Understand the principle of comparative advantage, including its formal expression.
- analyze the linkages between trade, labor and capital movements, international fragmentation of production, economic well-being and the income distribution and to identify and critically examine policy implications of these linkage
- Apply equilibrium models to analyze the economic effects of policy interventions including tariffs, quotas, export subsidies, anti-dumping duties, countervailing duties and the creation of preferential trading agreements.
- Critically analyze these policy interventions in terms of their costs and benefits, including their implications for economic well-being, performance and competitiveness.
- Understand major recent developments in the world trading system and comment critically on their effects on individual economies and on the wider international Community.

Teaching & Learning Methodology

All of you are required to participate **constructively** in discussions. You are expected to utilize web sites, periodicals, and other resources to contribute in class discussions and complete necessary assignments.

The following methods and forms of study are used in the course:

- Lectures
- Attendance and punctuality
- Overall discipline and behavior in class.
- Each participant's involvement and constructive contribution in class discussion.

Textbook(s)/ Reference Book(s)

- Feenstra, Robert C. and Alan M. Taylor, 2014, International Economics, 3rd edition, Worth Publishers (ISBN-13: 978-1-4292-7844-7; ISBN-10: 1-4292-7844-7)

Online research

Some useful links:

- WTO, <http://www.wto.org>
- UNCTAD, <http://www.unctad.org>
- OECD, <http://www.oecd.org>
- Ministry of Foreign Affairs and Trade, NZ, <http://www.mfat.govt.nz>
- Economists: For a glossary of terms used in international economics, see Alan Deardorff's (University of Michigan) website at <http://www-personal.umich.edu/~alandear/glossary/>

Grading Policy

As in previous courses

WEEK-WISE COURSE OUTLINE

Week	Contents/Description	Learning Outcomes
1	The Ricardian Model <ul style="list-style-type: none"> • Introduction; • Trade and Technology (The Ricardian Model) 	<ul style="list-style-type: none"> • Using constant-returns-to-scale technologies that differ across countries and goods. • Comparative Advantage

WEEK-WISE COURSE OUTLINE		
2	Specific-factors Model <ul style="list-style-type: none"> • Basic Assumptions • Specific Factor Model Results 	<ul style="list-style-type: none"> • The student will learn about the detailed assumptions of the specific factor model. • The student will learn how price changes affect wages, rents, and factor returns using diagram. • The student will learn about the real wage and real rent effects of free trade in a specific factor model.
3	Heckscher-Ohlin Model; <ul style="list-style-type: none"> • Tutorial/Class Activity 	<ul style="list-style-type: none"> • The Student will able to developed a mathematical model • The student will learn about the differences in factor endowments • assumptions • The student will learn about the identical production technology. • The student will learn about the H-O model is a factorial one
4	Movement of Labor <ul style="list-style-type: none"> • The labor movement as a social movement & other economic justice movements • The relationship of economic justice to urban settings & populations 	<ul style="list-style-type: none"> • to familiarize students with the historical and contemporary relationships between the labor movement and social work; • to explore the ways in which the labor movement is changing and understand some of the challenges it faces; • -to explore the implications of labor's issues and issues of economic justice for urban settings and populations
5	Movement of Capital <ul style="list-style-type: none"> • Scope and Nature 	<ul style="list-style-type: none"> • The student will learn about Capital movement between countries • The student will learn about Managing Capital flow
6	Increasing Returns to Scale <ul style="list-style-type: none"> • Tutorial/Class Activity 	<ul style="list-style-type: none"> • The student will learn about What Is Returns to Scale? • The student will learn about Increasing returns to scale
7	New World Trading Environments <ul style="list-style-type: none"> • Background on the methodology • <u>World Trade Outlook Indicator</u> 	<ul style="list-style-type: none"> • The student will Learn about the indicator of new world trading environment • And the student will also able to understand the methodology
8	REVISION WEEK	
9	MID TERM EXAM	
10	Import Tariffs and Quotas <ul style="list-style-type: none"> • Class activity 	<ul style="list-style-type: none"> • The student will Learn about trade tariff and quotas
11	Export Subsidies <ul style="list-style-type: none"> • low-cost loans, • tax relief for exporters 	<ul style="list-style-type: none"> • The student will learn about export subsidies • The student will learn about low-cost loans • The student will learn about tax relief for exporters
12	WTO <ul style="list-style-type: none"> • Trade Agreements; • Class Activity 	<ul style="list-style-type: none"> • The student will learn about the WTO • The student will learn about the Trade agreement

WEEK-WISE COURSE OUTLINE			
13	The Capital Asset Pricing Model <ul style="list-style-type: none"> the pricing of risky <u>securities</u>, generating expected returns for assets 	<ul style="list-style-type: none"> The student will learn about the capital asset pricing mode The student will learn about the expected risk and return. 	
14	The Gains from Trade <ul style="list-style-type: none"> sum of consumer surplus producer profits specialization in production 	<ul style="list-style-type: none"> The student will learn about the gains from trade The student will learn about the consumer surplus The student will learn about the Specialization in production. 	
15	Non-traded Goods in an asymmetric trade Model <ul style="list-style-type: none"> Introduction The Model The static equilibrium <ul style="list-style-type: none"> Equilibrium in the domestic Market World Trade Equilibrium 	<ul style="list-style-type: none"> The student will learn about the Non-traded goods in an asymmetric trade model The student will learn about the static equilibrium 	
16	Trade Regimes in Pakistan. <ul style="list-style-type: none"> FRAMEWORK AND OBJECTIVES TRADE POLICY FORMULATION AND IMPLEMENTATION Institutional and legal framework 	<ul style="list-style-type: none"> The student will learn about the trade regimes in Pakistan The student will learn about the Framework and Objective of Trade Regime in Pakistan The student will learn about the Trade Policy formulation and Implementation The student will learn about the institutional and legal framework 	
17	REVISION WEEK		
18	FINAL EXAM		

MATHEMATICAL ECONOMICS

Course Name	Mathematical Economics	Prepared On	July 2017		
Course Code	ECO 870				
Credit Hours	3				
Course Prereq. Name	NONE				
Course Prereq. Code		Revised On			
Course Type	Core Course				
Program	PhD Economics				
Semester					
Course Description					
The structure of the course includes advanced approaches of linear algebra, multivariable calculus, a general optimization problem of function of several variables both without restrictions and with restrictions formed by equalities and inequalities. The course material should teach students to understand and prove the basic methods of linear algebra and calculus, and also to investigate the economic problems of comparative statics and optimization within the framework of advanced tools of mathematical models. The purpose of the course is not so much acquisition of new skills in a solution of mathematical problems relevant to economic applications, but study of methods of proofs and strict reviewing of some sections of mathematics.					
Course Learning Outcomes					

Sr.No.	Description
<i>On completion of the course, Student will have following general understanding such as:</i>	
1	To lean and develop the basic mathematical concepts with proper use of those techniques and methods
2	Solution and applications of mathematical tools in economics
3	Solution of optimization problems
4	Testing for equilibrium conditions
5	Broad overview of the subject and its applications
Teaching & Learning Methodology	
As in previous courses	
Textbook(s)/ Reference Book(s)	
<ul style="list-style-type: none"> A.C. Chiang and Kevine W. Fundamental Methods of Mathematical Economics, 4th edition, 2005. Mathematics for Economists, Carl Pearson and Lawrence Blume, latest edition. Mathematics for Economics, Michael et al., second edition. 	
Grading Policy	
As in previous courses	

WEEK-WISE COURSE OUTLINE		
Week	Contents/Description	Learning Outcomes
1	Introduction <ul style="list-style-type: none"> Nature of Mathematic Economics Mathematical versus Non-mathematical Economics Econometrics versus Mathematical Economics 	<ul style="list-style-type: none"> Understanding about Nature of Economics of Maths Need and Importance of Mathematics tools in Economics General applications
2	Economic Models <ul style="list-style-type: none"> Nature of Mathematic and Economic Models Concepts of set theory and its applications Relation and Functions 	<ul style="list-style-type: none"> Understanding about various forms of data Set Working with Mathematical Models Use of mathematic functions
3	Economic Models <ul style="list-style-type: none"> Types of Functions Constant and Polynomial Functions Nonalgebraic functions Functions with more than two variables Selected Examples/Exercise 	<ul style="list-style-type: none"> Understanding about various forms and use of economic models Use of Nonalgebraic function Working with more than one explanatory variables
4	Equilibrium Analysis in Economics <ul style="list-style-type: none"> Partial Market Equilibrium– A linear Model Partial Market Equilibrium– A Nonlinear Model Linear NonLinear functions Selected Examples/Exercise 	<ul style="list-style-type: none"> Performing Equilibrium analysis for Linear and Nonlinear functions Construction of Economic Models Exercise with Economic Models
5	General Market Equilibrium <ul style="list-style-type: none"> Two Commodity Market Model n-Commodity Model Selected Example/Exercise 	<ul style="list-style-type: none"> Working with two and n commodity market and their solution Equilibrium in National Income Models
6	Linear Models and Matrix Algebra <ul style="list-style-type: none"> Matrices and Vectors Matrix Operation 	<ul style="list-style-type: none"> Understanding about nature of Matrix and its use in Economics Laws of Matrix solution

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> • Matrix laws • Solution to Matrix • Selected Example/Exercise 	<ul style="list-style-type: none"> • Selected applications
7	<p>Linear Models and Matrix Algebra (continued)</p> <ul style="list-style-type: none"> • Testing for singularity of matrix • Inverse of matrix • Cramer's Rule • Selected Applications 	<ul style="list-style-type: none"> • Solution of Matrices • Use of Cramer's Rule in Matrix operation
8	<p>Comparative Statistics and Concept of Derivatives</p> <ul style="list-style-type: none"> • Nature of comparative statistic • Derivatives and identification of slope • Concept limit and its use • Selected Applications 	<ul style="list-style-type: none"> • Understanding about comparative statistics • Use of limits in economics • Use of derivatives in economics
9	Mid Term Exam	
10	<p>Comparative Statistic Analysis: General Function Model</p> <ul style="list-style-type: none"> • Differentials • Total differentials • Rules of differentials • Selected applications 	Understanding about differential and total differentials and its applications in Economics
11	<p>Optimization: Special case of Equilibrium</p> <ul style="list-style-type: none"> • Optimum values versus extreme values • Relative maximum and minimum • Second derivatives test • Selected applications 	Understanding and application of optimization of economics
12	<p>Optimization with Equality Constraints</p> <ul style="list-style-type: none"> • Effects of constraints • Finding the stationary values • Utility maximization under constraint optimization • Selected applications 	Applications of constraint optimization in Economics
13	<p>Optimization with Equality Constraints (continued)</p> <ul style="list-style-type: none"> • Second order conditions • Quasiconcavity and Quasiconvexity • Constraint Optimization • Selected applications 	Applications of constraint optimization in Economics
14	<p>Non-linear Programming</p> <ul style="list-style-type: none"> • Nature of Nonlinear Programming • Kuhn-Tucker conditions • Economic Application 	Application of Nonlinear Programming in Economics
15	<p>Non-linear Programming (continued)</p> <ul style="list-style-type: none"> • Constraint Qualifications • Theorem in Nonlinear Programming • Illustrative Examples 	Application of Nonlinear Programming in Economics
16	<p>Economic Dynamics and Integral Calculus</p> <ul style="list-style-type: none"> • Dynamics and Integrations • Rules of Integrations • Improper integrals • Economic Applications of integrals 	Understanding about integrals and its applications of in Economics

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> • Illustrative Examples 	
17	Higher Order Differential Equations <ul style="list-style-type: none"> • Second order linear equations • Complex and circular functions • Analysis of complex root • Selected applications 	Understanding and Applications of higher order differential equation in Economics
18	Final Exam	

MONETARY ECONOMICS

Course Name	Monetary Economics (Elective)	Prepared On	July 2017					
Course Code	ECO 880							
Credit Hours	3	Revised On						
Course Prereq. Name	Applied Macroeconomic Theory							
Course Prereq. Code	Eco 802							
Course Type	Elective Course							
Program	PhD Economics							
Semester								
Course Description								
The course is an advance course for students of PhD. Strong skills in dynamic optimization and growth models is a prerequisite for this course. The course will introduce the students to monetary macro models under flexible prices or with nominal rigidities. Recent research papers on different issues using these techniques will also be discussed.								
Course Learning Outcomes								
Sr.No.	Description							
<i>On completion of the course, Student will have following general understanding such as:</i>								
1	Modelling of basic monetary models							
2	How money behaves in the short run and informational and portfolio rigidities							
3	How nominal price and wage rigidities are modelled							
4	An interpretation of optimal monetary policy under different conditions							
5	How monetary policy and financial crises are related.							
Teaching & Learning Methodology								
As in previous courses								
Textbook(s)/ Reference Book(s)								
<ul style="list-style-type: none"> • Carl Walsh, Monetary Theory and Policy, 3/e, MIT Press, 2010 								
Grading Policy								
As in previous courses								

WEEK-WISE COURSE OUTLINE

Week	Contents/Description	Learning Outcomes
1	Introduction to Monetary Economics	<ul style="list-style-type: none"> • Learn about the scope of Monetary Economic • Learn about empirical evidence on money inflation and output • Review of growth models • Learn about what Monetary Policy does
2	Monetary Policy Operation Procedures	<ul style="list-style-type: none"> • Students will learn about the monetary policy implementation • Students will learn about problem of monetary instrument choice and its monetary policy operating procedures

WEEK-WISE COURSE OUTLINE			
3	Monetary Economics Models	<ul style="list-style-type: none"> • Learn the formulation of the basic Solow model • Learn about how to incorporate government debt in the Solow model (Tobins Monetary Growth Model) • Learn that the steady state of interest is independent of any monetary variables 	
4	Dynamic General Equilibrium Monetary Models Money in the Utility Model (MIU Model)	<ul style="list-style-type: none"> • Learn the basics MIU Model • Be able to access and interpret the steady equilibrium • Learn about how the model assumes that money directly enters preferences 	
5	Dynamic General Equilibrium Monetary Models Ramsey Model Extension	<ul style="list-style-type: none"> • Be able to extend the Ramsey model for long run effects of money on growth. 	
6	Cash-in-Advance Model (1)	<ul style="list-style-type: none"> • Learn to formulate the basic Cash-in-Advance Model with production • Learn about how money accumulated in the previous period is necessary to finance current period transactions. • Learn about the problems with the model 	
7	Cash-in-Advance Model (2)	<ul style="list-style-type: none"> • Learn to formulate the basic Cash-in-Advance Model with production • Learn about how money accumulated in the previous period is necessary to finance current period transactions. • Learn about the problems with the model 	
8	Money in the Short Run and Lucas Islands Model	<ul style="list-style-type: none"> • Learn to formulate a model linking between money supply and price and output using rational expectations • Learn about the role of imperfect information • Learn about the new classical explanation of the Philips curve 	
9	<i>Mid Term Exam</i>		
10	Money in the Short Run, Imperfect Competition and Sticky Price	<ul style="list-style-type: none"> • Learn about extending the Lucas Island model with imperfect competition • Learn about the institutions of price setting • Learn about market structure and price adjustment • Learn about the consequence of imperfect competition on equilibrium 	
11	Normal Price and Wage rigidity (1)	<ul style="list-style-type: none"> • Learn about Taylor Model and interest rate forecasting • Learn about the CKM Model and Calvo Model and staggered pricing • Learn about time dependent Models with staggered prices 	
12	Normal Price and Wage rigidity (2)	<ul style="list-style-type: none"> • Learn about Taylor Model and interest rate forecasting • Learn about the CKM Model and Calvo Model and staggered pricing • Learn about time dependent Models with staggered prices 	
13	Optimal Monetary Policy	<ul style="list-style-type: none"> • The students will develop the basic DSGE Model 	
14	New Keynesian DSGE model Implication	<ul style="list-style-type: none"> • The new Keynesian DSGE model and explore its policy implications 	

WEEK-WISE COURSE OUTLINE			
15	Term Structure of Interest Rates		<ul style="list-style-type: none"> The students will learn the theories of term structure The students will learn about the risk structure of interest learn about expected inflations and tax cut effects on bond interest rates
16 & 17	Monetary Policy in the real world		<ul style="list-style-type: none"> The students will review specific papers on monetary policy and financial crisis Learn about liquidity and credit crunch Learn about asset price bubbles and monetary policy
18	Final Exam		

TOPICS IN ADVANCED ECONOMETRICS

Course Name	Topics in Advanced Econometrics	Prepared On	July 2017
Course Code	Eco 890		
Credit Hours	3		
Course Prereq. Name	NONE		
Course Prereq. Code		Revised On	
Course Type			
Program	PhD Economics		
Semester			
Course Description	<p>The main objective of the course is to introduce the students about the basic econometrics techniques and to prepare them to do their own applied work. The course will focus on modern econometric techniques, addressing both technical derivations and practical applications. Applications in the areas of microeconomics, macroeconomics and International Economics will be considered. In this course, will cover univariate and multivariate regression analyses and various estimation problems, qualitative analysis and simultaneous equation system. We will also cover various econometric issues, such as autocorrelation, multicollinearity and heteroskedasticity and their proper remedial measures. It will also cover various time series, cross sectional and panel data analyses.</p>		
Course Learning Outcomes			
Sr.No.	Description		
<i>On completion of the course, Student will have following general understanding such as:</i>			
1	To lean and develop the basic econometrics concepts, with special focus on inferences and application in business education		
2	Construction and estimation of regression equation and its interpretation		
3	Understanding about various econometric issues and their proper remedial measures		
4	Computer applications of relevant various softwares, like EXCEL, SPSS, STATA and EVIEWS		
5	Broad overview of the subject and its applications		
Teaching & Learning Methodology			
As in previous courses			
Textbook(s)/ Reference Book(s)			
<ul style="list-style-type: none"> Basic Econometrics, Gujarati D.N. and Proter D.C. 5th Edition, 2009. Johnston, J. and J. Dinardo, Econometric Methods, (4th edition), McGraw-Hill, 1997. Applied Econometrics, Astorio D. and Hall S. 2nd Edition, 2011. Greene, W.H., Econometric Analysis, (7th edition), Pearson, 2012. 			
Grading Policy			
As in previous courses			

WEEK-WISE COURSE OUTLINE		
Week	Contents/Description	Learning Outcomes
1	Structure of Economic Data <ul style="list-style-type: none"> • Time Series data • Cross Sectional data • Panel data • Data handling 	<ul style="list-style-type: none"> • Understanding about various forms of data Set • Working with data in software • Transformation of data
2	Classical Linear Regression Model <ul style="list-style-type: none"> • Nature of Simple Regression Analysis • Regression versus Causation • Regression versus Correlation • Selected Examples/Exercise 	<ul style="list-style-type: none"> • Understanding about simple regression and correlation • Interpretation of results • Concept of Goodness of Fit • Performing a simple regression equation estimation by using various softwares
3	Empirical Estimation: Multiple Regression Analysis <ul style="list-style-type: none"> • Motivation for Multiple Regression Analysis • Interpretation of Results • Selected Examples/Exercise 	<ul style="list-style-type: none"> • Performing a multiple regression equation estimation by using various softwares • Interpretation of empirical results • Use of exercise in Business Education
4	Empirical Estimation: Inferences and Testing of hypothesis <ul style="list-style-type: none"> • Hypothesis Testing • Establishment of confidence interval • Testing of Individual coefficients • Testing of overall model • Selected Example/Exercise 	<ul style="list-style-type: none"> • Performing hypothesis testing procedure • Formation of confidence interval • Findings on the basis of Inferences • Computer Applications
5	Dummy Variable Regression Analysis <ul style="list-style-type: none"> • Nature of Dummy Variable Regression Equation • ANCOVA Models • Selected Example/Exercise 	<ul style="list-style-type: none"> • Understanding about nature of dummy variable regression equation • Difference between ANOVA and ANCOVA models • Interpretation of regression equation
6	Multicollinearity <ul style="list-style-type: none"> • Multicollinearity and Its Consequences • Detection of Multicollinearity • Estimation in the presence of Multicollinearity 	<ul style="list-style-type: none"> • Detecting the problem of Multicollinearity • Distinguishing between perfect and imperfect multicollinearity • Consequences of Multicollinearity
7	Heteroskedasticity <ul style="list-style-type: none"> • Heteroskedasticity and Its Consequences • Detection of Heteroskedasticity • Estimation in the presence of Heteroskedasticity 	<ul style="list-style-type: none"> • Recognizing the problem of Heteroskedasticity • OLS estimation in the presence of Heteroskedasticity • Consequences in the presence of Heteroskedasticity
8	Autocorrelation <ul style="list-style-type: none"> • Autocorrelation and Its causes • First and Higher order autocorrelation • Detection and Resolving of Autocorrelation 	<ul style="list-style-type: none"> • Understanding about autocorrelation • What causes of autocorrelation? • Detection and remedial measures of autocorrelation
9	Mid Term Exam	
10	Non Linear Regression Models	<ul style="list-style-type: none"> • Understanding about Linear and Nonlinear models

WEEK-WISE COURSE OUTLINE		
	<ul style="list-style-type: none"> • Estimation of Linear and Nonlinear regression model • Trial and Error Method • Illustrative Examples 	<ul style="list-style-type: none"> • Application of Nonlinear models
11	<p>Qualitative Response Regression Models</p> <ul style="list-style-type: none"> • Nature of the Model • Linear Probability Model (LPM) • The Logit Model (Alternative to LPM) • Illustrative Examples 	<ul style="list-style-type: none"> • Understanding of LPM and Logit Models • Applications of LPM
12	<p>Qualitative Response Regression Models</p> <ul style="list-style-type: none"> • The Probit Model and its Nature • Probit Estimation with grouped data • Tobit Model and Its estimation • Illustrative Examples 	<ul style="list-style-type: none"> • Nature of Probit and Tobit Model • Estimation and Interpretation of Logit, Probit and Tobit Models
13	<p>Simultaneous Equation Models</p> <ul style="list-style-type: none"> • Nature of Simultaneous Equation • Estimation the Equation • Illustrative Examples 	<ul style="list-style-type: none"> • Identifying nature of Simultaneous Equation • Estimation of Equation and its interpretation
14	<p>Time Series Econometrics</p> <ul style="list-style-type: none"> • ARCH Models • GARCH Models • Illustrative Examples 	<ul style="list-style-type: none"> • Nature of ARCH-GARCH models • Measuring ARCH and GARCH Models • Empirical Illustration of ARCH-GARCH Models
15	<p>Time Series Econometrics</p> <ul style="list-style-type: none"> • VAR Models • Causality Tests • Cointegration and ECM • Illustrative Examples 	<ul style="list-style-type: none"> • Nature of VAR Model and its application • Granger causality test • Application in Financial development and economic growth
16	<p>Panel Data Econometrics: Traditional and Advanced</p> <ul style="list-style-type: none"> • Traditional panel data models • Advantages of panel data • Fixed/Random effects models • Illustrative Examples 	<ul style="list-style-type: none"> • Understanding about panel data models • Linear panel model • Recognizing the importance of fixed and random effect models • Application/Interpretation of equation
17	<p>Cointegration and VAR Modelling</p> <ul style="list-style-type: none"> • Nature of Cointegration • Lag length criteria • Estimation of Cointegration Model • VAR Modelling • Exercise 	<ul style="list-style-type: none"> • Understanding about tests of Cointegration • Use of proper lag length • Estimation for VAR
18	Final Exam	

Financial Details for the PhD Economics Program

Faculty Salaries				
	Faculty Cost As of 48x3 Credit Hours at 2300	Additional Faculty Cost on PhD Completion	Total Faculty Cost	Annual Total Faculty Cost
Year 1	31,200	-	31,200	62,400
	31,200	-	31,200	
Year 2	31,200	-	31,200	62,400
	31,200	-	31,200	
Year 3	31,200	-	31,200	62,400
	31,200	-	31,200	
Year 4	31,200	40,000	71,200	202,400
	31,200	-	31,200	
Year 5	31,200	40,000	71,200	202,400
	31,200	-	31,200	

Book Name	Price Per Quantity
Microeconomic Analysis, Hal Varian, Third Edition	12013.68
Walter Nicholson, " <i>Advance microeconomics</i> " 9 th edition, South Western College Publishing, USA	5785.26
McConnell Brue, " Microeconomics" 16th edition, Glencoe/McGraw-Hill	11473.68
Nicholson, and Snyder, Microeconomic Theory: Basic Principles and Extensions (10th Edition)	13475.79
D.Romer, Advanced Macroeconomics, third edition.	2104.21
Basic Econometrics, Gujrati D.N. and Proter D.C. 5th Edition, 2009.	19472.63
Johnston, J. and J. Dinardo, Econometric Methods, (4th edition), McGraw-Hill, 1997Applied Econometrics, Asterio D. and Hall S. 2nd Edition, 2011.	10478.74
A.C. Chiang and Kevine W. Fundamental Methods of Mathematical Economics, 4th edition, 2005.	25243.16
Mathematics for Economists, Carl Pearson and Lawrence Blume, latest edition.	17484.21
Mathematics for Economics, Michael et al., second edition.	7711.58
Carl Walsh, Monetary Theory and Policy, 3/e, MIT Press, 2010	4335.79
Kolstad, Charles. <i>Environmental Economics</i> . 2nd ed. Oxford University Press, 2010.	13257.89
Ecological Economics, Principles and Applications, by Herman. E. Daly and Joshua Farley	2520
Economics of Natural Recourses and the Environmental by David W. Pearce & R. Kerry Turner	1523.16
Natural Recourse and Environmental Economics, 3rd Edition, by Roger Preman, Yue Ma, James McGilvray & Michael Common	6038.88
Principles of Environmental Economics by Ahmed Hussen.	24210.53
Acemoglu, Daron. <i>Introduction to Modern Economic Growth</i> . Princeton University Press, 2009. ISBN: 9780691132921.	3554.07
Romer, D. (1996), Advanced Macroeconomics, McGraw-Hill.	5288.42
G.J. Borjas Labor Economics (3rd ed. McGraw Hill)	15000
Others	50000
Total Cost of all books	250971.68

TRANSCRIPT OF HOD MS BUIC'S PRESENTATION

Slide-1

PhD Economics at Bahria University Islamabad Campus

“To prepare researcher in the methods and ideas of modern economics”.

Slide-2

Start of PhD Economics program at BUIC

List of SIX Capital Sector Universities offering PhD Economics

- Quaid-e-Azam University Islamabad
- PIDE Islamabad
- IIUI Islamabad
- NUML Islamabad
- Federal Urdu University Islamabad
- Preston University Islamabad

MS/Mphil in Economics (17.5 years) would be eligible for admission

Slide-3

PhD Faculty at MS Department

- Dr. Abdul Sattar
- Dr. Sarwar Zahid
- Dr. Samreen Babar
- Dr. Muhammad Khalil

Recommendation

“ACM may give the permission to start PhD in Economics from Fall 2018 with the approval of HEC Pakistan”

Appendage 3020

BS ENGLISH (BUKC)

Introduction

Department of Humanities' BS English Program is a 04 Years Degree Program that will cover core areas of linguistics, literature and English language. In addition, the program will help the students to connect their knowledge of English language, linguistics and literature with other areas of social sciences such as psychology, Islamic studies, philosophy, Pakistan studies, international relations, communication, business studies, etc. to bring innovation in their educational and professional life thereby making them confident, independent, innovative and research-oriented.

Course of Study

The BS program in English is based on four years of education after higher secondary school. In the first two years, students will be offered compulsory and general courses from humanities and social sciences along with some foundational courses from the field of Linguistics and Literature. After two years, students will take advance courses from Linguistics and Literature.

While designing the curriculum for this proposed program, the guidelines of Higher Education Commission (HEC) and the curriculum of BS English of some leading national universities have been taken into account.

Title of the Degree:

Bachelors of Science in English

Target Audience: The target audience of this program will be the students interested in arts and humanities. They will represent Bahria University nationally as well as internationally in the field of arts and humanities particularly in English Language, Linguistics and Literature through their knowledge and research work.

Duration: 04 Years Full Time

Teaching System: Semester System

Sessions: Morning

Admission Requirement: As per BU policy, i.e., the candidates seeking admission in BS English should have qualified the Intermediate examination from any Board of Intermediate and Secondary Education in Pakistan 'OR' An examination equivalent to the Intermediate for which such candidates must submit an Equivalence Certificate issued by the Inter-Board Chairman Committee, Islamabad. Applicants must have scored 50% or more marks with at least 55 % marks in the subject of English.

a. Admission Criteria: The admission criteria will be based on the following:

SSC, HSSC, Admission Test and Interview

b. Intermediate (12 years of education) with a minimum of 50% **marks**

Structure of Program:

Total Credit Hours: 133 CR (15-18 credit hours per semester). CR of all courses 3 except Pakistan Studies (APK-102) and Islamic Studies (ISL-108) which will be 2 each

Division of Credit Hours

•	Compulsory Courses: 25 CR
•	General Courses: 24 CR
•	Foundational Courses: 24 CR
•	Major Courses (Linguistics and Literature): 30 CR
•	Core courses: 15 CR
•	Electives from Literature or Linguistics: 12 CR
•	Research Project each for Literature or Linguistics: 03 CR

Major courses are designed to provide knowledge and ideology that are essential to take up further studies in both specialized areas of Linguistics and Literature

Financial Implications:

Projected Earnings for the First 2 Years:

Semester	Students(minimum)			Fee per Student		Total Fee		
	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total
Spring 2018	10	0	10	80,000	0	800,00	0	800,000
Fall 2018	10	10	20	80,000	60,000	800,000	600,000	14,00,000
Spring 2019	10	20	30	80,000	60,000	800,000	12,00,000	20,00,000
Fall 2019	10	30	40	80,000	60,000	800,000	18,00,000	26,00,000
Total Earnings								68,00,000

Two years projected earnings: Rs. 68,00,000/-

Total Estimated Salaries for extra faculty for first two years:

Semester	Course	Salary @	Per semester Salaries
Spring 2018	6	1500x45=67,500	405,000
Fall 2018	12	1500x45=67,500	810,000
Spring 2019	18	1500x45=67,500	1215,000
Fall 2019	24	1500x45=67,500	1620,000
Total salary expenditure			40,50,000

Cost of Extra Books for the Library: Rs. 50,000/- Approx

Advertising cost for the promotion: Rs. 250,000/- Approx

Admin Cost: Rs.100, 000/- Approx for two years (25, 000 per semester)

HR Implications:

For the first 2 years (four semesters) any additional regular faculty member will not be required.

Launch of BS in English w.e.f. Spring 2018.

This program its roadmap and courses are ready to get approved from Academic Council.

Prospectus of Humanities and Social Sciences carries the Roadmap and details of courses.

**COURSE OBJECTIVES AND LEARNING OUTCOMES
BS (ENGLISH)**

COURSE CODE	COURSE TITLE	COURSE OBJECTIVES AND LEARNING OUTCOMES	CREDIT HOURS
1. ENG-105	Functional English	<p>To enable the students to:</p> <ul style="list-style-type: none"> • To understand and use English to express ideas and opinions related to students' real life experiences inside and outside the classroom. • To give reasons (substantiating) justifying their view • To understand and use signal markers • To extract information and make notes from lectures • To ask and answer relevant questions to seek information, clarification etc • Identify main idea/topic sentences • Find specific information quickly • Distinguish between relevant and irrelevant information according to purpose for reading • Recognize and interpret cohesive devices • Distinguish between fact and opinion • Guess the meanings of unfamiliar words using context clues • Use word formation rules for enhancing vocabulary • Use the dictionary for finding out meanings and use of unfamiliar words 	3
2. Pak-100	Pakistan Studies	<p>By the end of the course, students shall be able to</p> <ul style="list-style-type: none"> • To understand the history of the region comprising Pakistan • To understand the contending perspectives on the origins of the country, and examine its politics, society and culture. • Look at some contemporary developmental issues facing the country. 	2
3. ENG-103	Introduction to Literature (1)	<p>The course shall give the students a basic understanding of Literature. Among other things, the course shall enable students to comprehend literary texts</p> <ul style="list-style-type: none"> • Comprehend issues in British Literature in relation to authors, historical periods, major and minor figures, themes, genres or critical theories • Comprehend issues in American Literature in relation to authors, historical periods, major and minor figures, themes, genres or critical theories • Analyze ideas related to literature • Apply critical or theoretical approaches to literature • Summarize, analyze, and interpret literary texts • Synthesize ideas associated with British authors in relation to historical periods, major and minor figures, genres or critical theories • Synthesize ideas associated with American authors in relation to historical periods, major and minor figures, genres or critical theories 	3
4. ENG-104	Introduction to Linguistics	<ul style="list-style-type: none"> • Introduce students to the basic concepts of language 	3

		<ul style="list-style-type: none"> Get them familiarized with the core components of linguistics like phonology, morphology, syntax, semantics, discourse and pragmatics through this course. 	
5. HSS-102	Introduction to Philosophy	<p>Philosophy helps a Student in</p> <ul style="list-style-type: none"> Skill development Personal development Philosophy courses provide more than just knowledge of the world; they give a deep understanding of how the world works, even how it should work. Enable students to analyze closely and critically, to question thoroughly, and to write and think rigorously. 	
6. HSS-107	Introduction to Psychology	<ul style="list-style-type: none"> This program aimed at inculcating theoretical concepts of this emerging field of Psychology while providing an exposure to its real-world application. It will enable students to understand the psychological factors of various issues and aspects prevailing in the society. Also, this program will be a baseline for many who want to pursue higher studies in the field of psychology from any recognized university in the world. The students will be given an opportunity to explore different fields of psychology like cognitive psychology, child and adolescent psychology, child development, social psychology, cross-cultural psychology and many more. 	3
7. ENG-120	English Writing Skills (English-II)	<p>To enable the students to:</p> <ul style="list-style-type: none"> Write effective and coherent paragraphs Comprehend the overall and internal organization of an academic essay Write an effective thesis statement Use pre-writing strategies to plan writing Generate ideas from sources to develop content Develop coherent content and support with relevant details Write a 4-5 paragraph expository/take-a-stand academic essay Give critical peer feedback Use peer and teacher feedback to edit writing Build academic vocabulary Use a variety of accurate sentence structures Use grammatical structures accurately Utilize digital literacy tools to develop writing and grammar skills Reflect on and evaluate learning and performance, and set goals for progress 	3
8. ISL-100	Islamic Studies	<ul style="list-style-type: none"> To provide Basic information about Islamic Studies To enhance understanding of the students regarding Islamic Civilization To improve Students skill to perform prayers and other worships To enhance the skill of the students for understanding of issues related to faith and religious life. 	2

9. HSS-111	Introduction to International Relations	This course contributes to the following Program Learning Outcomes <ul style="list-style-type: none"> Students will accurately identify the major theories and dominant paradigms used in the study of international relations and foreign policy analysis including realism/neo-realism, liberalism/neo-liberalism, globalist/Marxist, and postmodernism/post-structuralism. Students will identify the major actors in the international system on the macro, mezzo, and micro levels of analysis and their function and interaction in interstate relations. Students will identify and describe the major processes in the international system including globalization, integration, and the causes of conflict. 	3
10. ENG-110	History of English Literature (1)	The course will: <ul style="list-style-type: none"> Engage students with a wide variety of approaches to literature and cultural history. Students will have the opportunity to explore literary theory Enable students to become critical thinkers, and literary experts 	3
11. MAT-105	Mathematics	By the end of the course, students shall be able to <ul style="list-style-type: none"> Use mathematical models to solve practical problem. Read mathematics with understanding and communicate mathematical ideas with clarity and coherence. Perform standard mathematical computations with accuracy. Use technology to solve mathematical problems. 	3
12. ENG-112	Phonetics and Phonology	By the end of the course students should be able to, <ul style="list-style-type: none"> Know the basic sounds and classify the English vowels and consonants. Learn contemporary standard English accents compare and contrast the phonological systems of standard English with other languages like Urdu Explain progresses typical of connected speech (assimilation, elision, liaison, reduction, insertion, etc.) and guess their manifestation in English; Transcribe phonemically spoken/written texts in a Standard English accent. 	3
13. ENG-201	Oral Communication & Pre.Skills, (English-III)	 <ul style="list-style-type: none"> Learn and practice the skill of Interpersonal communication Practice and learn how people create and manage their relationships Focus on the presentation skills, verbal and non verbal communication Interviewing skills Leadership skills To develop cognitive tools for researching, evaluating, analyzing and synthesizing written and oral communication. To learn the basic principles of speech presentation and delivery including, but not limited to; audience analysis, selection of topic/content, research, and presentation. 	3

14. ENG-202	Morphology & Syntax [I]	<ul style="list-style-type: none"> • Be familiar with word- formation processes, categories, functions and principal structures of English Morphology and Syntax. • Recognize and analyze English word structure, phrase structure and sentence structure in terms of categories and functions • Use the appropriate terminology in morphological and syntactic description. • Display analytical skills in describing words and sentences categorically and functionally. • Analyze English morphemes and sentences and apply their knowledge in the productive skills; writing and speaking. 	3
15. ENG-203	Introduction to Literature (2)	<p>The course shall give the students a basic understanding of Literature. Among other things, the course shall enable students to comprehend literary texts</p> <ul style="list-style-type: none"> • Comprehend issues in British Literature in relation to authors, historical periods, major and minor figures, themes, genres or critical theories • Comprehend issues in American Literature in relation to authors, historical periods, major and minor figures, themes, genres or critical theories • Analyze ideas related to literature • Apply critical or theoretical approaches to literature • Summarize, analyze, and interpret literary texts • Synthesize ideas associated with British authors in relation to historical periods, major and minor figures, genres or critical theories • Synthesize ideas associated with American authors in relation to historical periods, major and minor figures, genres or critical theories 	3
16. BES-204	Introduction to Computer Applications	<p>Upon successful completion of the program, students should have the skills to:</p> <ul style="list-style-type: none"> • Work effectively with a range of current, standard, Office Productivity software applications. • Evaluate, select and use office productivity software appropriate to a given situation. • Apply basic adult learning and assessment principles in the design, development, and presentation of material produced by office productivity applications. • Demonstrate employability skills and a commitment to professionalism. • Operate a variety of advanced spreadsheet, operating system and word processing functions. • Solve a range of problems using office productivity applications, and adapt quickly to new software releases. • Maintain quality assurance through critically evaluating procedures and results 	3
17. ECO-205	Economics	<ul style="list-style-type: none"> • The course is designed for the beginners with either no formal background or very little acquaintance with economics. 	3

		<ul style="list-style-type: none"> The objective is to give the students with a clear understanding of the basic concepts, tools of analysis and terminologies used in microeconomics. Emphasis will be on the use of graphs, diagrams and numerical tables/schedules for exposition. 	
18. MGT-206	Entrepreneurs hip	<ul style="list-style-type: none"> The basic objectives of EDP are to: Develop and strengthen entrepreneurial quality, i.e., motivation or need for achievement. To analyze environmental set up relating to small industry and promoting it. Removing unemployment Enhancing industrial development Developing industrially backward region. Select project/product. Formulate the project. Understand the process and procedure involved in setting up small units Know the sources of help and support available for starting a small-scale industry. Acquire necessary managerial skill required to run the industrial unit. Know the pros and cons of being an entrepreneur. Helping the person to understand environmental changes and opportunities. Acquaint and appreciate the needed social responsibility/entrepreneurial discipline. 	3
19. ENG-207	Advanced Academic Reading& Writing skills	To enable the students to: <ul style="list-style-type: none"> Plan and edit their writing Identify different genres in academic writing Apply academic writing style, organization, grammar, mechanics, and citation format Develop general and discipline-specific academic vocabulary Read academic writing rhetorically to bring further knowledge to their writing and research 	3
20. HSS-208	Human Rights and Citizenship	Upon successful completion of this course, the student will be able : <ul style="list-style-type: none"> To provide specialized training in ethics, politics and philosophy of law, giving students the skills to understand and to take decisions regarding human rights and democratic policies, problems related to coexistence in today's multicultural contexts, subjectivity and identity, and the dilemmas encountered in bioethics and biopolitics. The need to gain greater insight into the major problems of coexistence and social and political organization in the contemporary world from an academic viewpoint The applicability of this research to the life of institutions and associations active in this area in Western countries today, and the benefits to be gained from training students to enter professional practice and, particularly, to work in academia. 	3

		<ul style="list-style-type: none"> To train students to carry out placements or pursue training to become educators. 	
21. HSS-209	Gender Studies	<ul style="list-style-type: none"> To create awareness and to develop communities where both men and women can live and work in mutual respect, peace and harmony To create awareness among men and women regarding their social, economic, political and legal rights. Participants of this program will be able to learn the application of Gender Studies and Feminist analyses of existing structures and traditional historical, social and cultural clichés and will be trained to analyze the variety of ways in which systems of dominance function and have evolved over time, including patriarchy, sexism, racism etc. This program aims to enable participants to think critically about gender roles that shape the personal, social, domestic, religious, political and economic worlds 	3
22. ENG-210	Semantics	<ul style="list-style-type: none"> Introduce students to the basic concepts of semantics. Help students to conceptualize the relationship between words and their meaning. To understand and learn why meaning is more complex than simply the words formed in a sentence. 	3
23. ENG-211	History of English Literature (2)	<p>The course will:</p> <ul style="list-style-type: none"> Engage students with a wide variety of approaches to literature and cultural history. Students will have the opportunity to explore literary theory Enable students to become critical thinkers, and literary experts 	3
24. QTM-212	Introduction to Statistics	<p>The course shall give the students a basic understanding of Statistics. Among other things, the course shall enable the students to</p> <ul style="list-style-type: none"> Recognize and apply some common probability distributions, and assess if underlying assumptions for the distribution seem reasonable. Be able to perform basic statistical calculations and graphical analyses. Analyze research questions based on statistical data, draw relevant conclusions, and be familiar with the limitations of particular statistical methods. Be able to discuss and reflect upon ethical topics relevant to statistical methods. 	3
25. ENG-301	Visionary Discourse	<p>This course will:</p> <ul style="list-style-type: none"> Enable students to have clear ideas about what should happen or be done in the future. Help students having a powerful imagination. Be able or likely to see visions 	3
26. ENG- 302	Literary Criticism	<ul style="list-style-type: none"> The course is intended to raise a question: why and how to understand literature through criticism? Comparatively on wider perspective, student may ask Why to study “English” literature or literatures in “English”? 	3

		<ul style="list-style-type: none"> “Principles of Literary Criticism” will focus much on the poetic and dramatic forms to highlight some significant trends and concepts around “poetry”, “imagination” and “tradition”. Students will learn the importance of critical thinking in studying and interpreting literary texts 	
27. ENG-309	Morphology & Syntax [II]	<ul style="list-style-type: none"> Be familiar with word- formation processes, categories, functions and principal structures of English Morphology and Syntax. Recognize and analyze English word structure, phrase structure and sentence structure in terms of categories and functions Use the appropriate terminology in morphological and syntactic description. Display analytical skills in describing words and sentences categorically and functionally. Analyze English morphemes and sentences and apply their knowledge in the productive skills; writing and speaking. 	3
28. ENG-303	Classical Poetry (14-18 century)	<ul style="list-style-type: none"> To focus on a genre-specific historical development To perceive Poetry as refined commentary on the aesthetic concerns of its time To develop keen awareness of poetic language and tone 	3
29. ENG-310	Socio-linguistics	<ul style="list-style-type: none"> Understand the basic concepts and issues of sociolinguistics. Learn the functions of language and its variation in the society. Learn the Sense Relations/ Lexical Relations (Hyponymy; Synonymy; Antonym, Homonymy and Polysemy) Syntactic Semantics (Contradiction, Ambiguity, Semantic anomaly, Entailment, Presupposition) 	3
30. ENG-304	Novel (18-19 Century)	<ul style="list-style-type: none"> The Aim of this course is to enable the students to have a complete view of 18th to 19th century Novel which is rich in diversity, creativity and popular appeal. To focus on the relationship between literature and contemporary life. 	3
31. ENG-311	Pedagogical Grammar	<ul style="list-style-type: none"> Introduce the students to some basic concepts of English grammar. Understand, analyze and enhance student’s own grammatical competence. Learn to teach Grammar in Context 	3
32. ENG-305	Research Methodology	<ul style="list-style-type: none"> Introduce students to the range of research methods available to English language Develop interesting and important research questions Analyze and evaluate the quality of own and other scholars’ research. 	3
33. ENG-306	Literary Criticism & Theory	<ul style="list-style-type: none"> To familiarize students with texts that deal with theories about criticism where they would encounter philosophical and critical thoughts on selected topics. This course in line with the topics taken up in literary movements would prepare the students for critical and 	3

		analytical analysis of texts and help them in their research work.	
34. ENG-312	Discourse Analysis	<ul style="list-style-type: none"> Gain an advanced and sophisticated understanding of the concept of 'context'. Draws students to the investigation of socially-situated texts and talk Gain knowledge and understanding of the (symbolic) function of language in social life, and the role that language plays in the construction and shaping of social relationships 	3
35. ENG-307	Classics in Drama	<ul style="list-style-type: none"> The course will present some classic plays which have influenced the development of English drama. It will represent various forms for example tragedy and comedy and their variations. The course is designed to impart, discuss, evaluate, and above all enjoy the spirit of classics in drama. The socio-cultural aspects of society reflected in the drama of the selected ages will also be highlighted. Students will be able to apply their knowledge of the elements of drama to their critical reading. 	3
36. ENG-313	Psycholinguistics	<ul style="list-style-type: none"> Develop in the students an awareness and understanding of different variables that interact with and upon the teaching and learning of language. Understand The connection between Psycholinguistics & Neurolinguistics Read and analyze affective and personality factors, Cognitive styles and motivation 	3
37. ENG-308	Romantic Poetry (19-20 Century)	<ul style="list-style-type: none"> The period of romantic aesthetics covered under this course starts from 1789 with the advent of Blake's work. This is the romantic revival period in which Blake, Wordsworth, Coleridge, Shelley, Byron, Keats, Lamb etc establish its immense poetic and prosaic richness. The aim is to develop in the student an awareness of the second wave of the Romantics and to enable them to distinguish between the poets of the agekeeping in mind the similarities that group them together. Also, will equip the student with wide range of comparative approach between different periods of history. 	3
38. ENG-314	Lexical Studies	<ul style="list-style-type: none"> Learn the basic concepts related to lexicology and lexicography. Enrich vocabulary Take issues of word-structure critically and conduct practical thinking Analyze native languages like Urdu Develop the process of compiling and editing dictionaries. 	3
39. ENG-401	Contemporary Literature (1)	<ul style="list-style-type: none"> The aim of this part of the course in literature is to give reader an opportunity to read representative works of 20th century writers including poets, dramatists and novelists. It would enhance their understanding of the emerging trends in 20th century literature and prepare them for full length study of the genres 	3

40. ENG-405	Stylistics	<ul style="list-style-type: none"> • Critically discuss concepts of style and different stylistic approaches • Identify and discuss stylistic devices and their possible effects in various kinds of texts • Analyze texts from a stylistic point of view • Critically review and give constructive criticism on the work of others • Study the features of distinctive varieties of language • Uncover the layers, patterns and levels that constitute stylistic description. 	3
41. ENG-402	South Asian Literature	<ul style="list-style-type: none"> • The aim of the course is to familiarize the students with the facility that South Asian Writers have with the English Language and the regional flavor that they lend to it. • It will help generate a debate on the context of a work of literature through representation of the region by its people. • 	3
42. ENG-406	Language Learning Theories	<ul style="list-style-type: none"> • To introduce the basic theories of language to enhance students' understanding of Linguistics. · • To develop a thorough understanding of the philosophical and theoretical frameworks, the knowledge of which is essential for linguistic analysis. · • To focus on broader issues such as needs and motivation, module design and appropriate pedagogy. • · To reflect on theory on relation to practice 	3
43. ENG-403	American Literature/Canadian Literature	<ul style="list-style-type: none"> • The course focuses on connecting the diverse Western movements such as Realism, Naturalism, Romanticism, Transcendentalism, Modernism, etc. as they influence multiple trends in American literary heritage and nationalism. • The course will highlight these emerging trends as they culminate into the opening of democratic vistas along with repercussions of industrial and scientific expansion. • Race gender and class equations reinterpret the central meaning of America and of the changing social and economic values. Basically there may be several ways to access American Literature, but whether we follow simple chronology or connect through themes and genres, the final objective of this course is to look for the sense of democratic diversity amid the constitutional unity of the US. • This part of the course surveys the origins of American literary movements with reference to the representative writers chosen. It sets some direction to the study of specific trends in the American Novel. • It stresses the diversity and uniqueness of the American character and experience, and its foundational voices of self-acclaimed Puritan holiness along with the revolutionary expansions of the so called patriots. • It also highlights various phases of the American Renaissance, Romantic awareness and Transcendentalism, the Civil War etc. 	3

44. ENG-407	Syllabus design & Testing	<ul style="list-style-type: none"> Learn and evaluate approaches to syllabus design, including their theoretical base, in relation to the broader curriculum. Assess the influence of major theories of second language acquisition on the design of major types of syllabuses. Develop the principles and process of evaluating and designing a language syllabus. Synthesize appropriate assessment strategies for testing the four skills (LSRW) 	3
45. ENG-404	Translational Theory & Literary Studies	<ul style="list-style-type: none"> This course is aimed at familiarizing the students with fundamental concepts of translation procedure. The students will be provided with basic information about different techniques and methods of translation. Students, thus, will be able to understand the complexities of translation from one language to the other in this case from English to Urdu and from Urdu to English through studying translated literary works from round the world, some classics in World Literature, but more from the regions they belong. This way they will be able to identify elements of universal literary merits and critically compare some of great works in translation. 	3
46. ENG-408	TEFEL-1	<ul style="list-style-type: none"> To enable the students to: Demonstrate a general understanding of, and familiarity with the world of teaching English as a Foreign Language including general terminology, the profession's qualifications, further training options and career opportunities. Demonstrate a good grasp and a basic understanding of the communicative approach to teach English as a Foreign Language. Write objectives and appropriate lesson plans. 	3
47. ENG-409	Contemporary Literature (2)	<ul style="list-style-type: none"> The aim of this part of the course in literature is to give reader an opportunity to read representative works of 20th century writers including poets, dramatists and novelists. It would enhance their understanding of the emerging trends in 20th century literature and prepare them for full length study of the genres 	3
48. ENG-412	TEFEL-2	<p>To enable the students to:</p> <ul style="list-style-type: none"> Demonstrate a general understanding of, and familiarity with the world of teaching English as a Foreign Language including general terminology, the profession's qualifications, further training options and career opportunities. Demonstrate a good grasp and a basic understanding of the communicative approach to teach English as a Foreign Language. Write objectives and appropriate lesson plans. 	3
49. ENG-410	Post Colonial Literature	<p>After completing this course, students will be able to:</p> <ul style="list-style-type: none"> discuss, and analyze colonial and postcolonial texts Know how race, class, gender, history, and identity are presented and problematized in the literary texts 	3

		<ul style="list-style-type: none"> Have an understanding of the relationship between Great Britain (and implicitly the West) and nations that were once colonised 	
50. ENG-413	Pragmatics	<ul style="list-style-type: none"> Know how people perform, interpret, and respond to language functions in a social context. Acquire basic theoretical competences in pragmatics and basic skills related to pragmatic research. Read pragmatic studies and set up pragmatic research 	3
51. ENG-411	Literary Discourse & Journalistic Writing	<ul style="list-style-type: none"> The course offers a rigorous test to improve the nonfiction writing abilities of students seriously considering a career in journalism. By reading award winning authors; reporting and writing nonfiction pieces and critiquing each other's work, students will gain expertise in writing for journalistic purposes. In depth, this course will teach students to write reports and feature stories. 49 They will learn to gather and organize material, develop feature and editorial writing techniques. Reading from the selected literary texts and then assigned writing drills virtually every class on topics like accidents, crime, government, and courts, etc. will be part of the practice. This practice shall then be combined with writing features, profiles, and the art of narrative story telling. 	3
52. ENG-414	Introduction to Applied Linguistics	<p>The students will be able to develop</p> <ul style="list-style-type: none"> To familiarize students with the most common concepts and terminologies in applied linguistics for example; phonology, morphology, syntax, semantics, discourse and pragmatics. . To introduce the basic concepts of language which have immediate relation to students' ordinary as well as academic life. . To develop critical reading and writing skills to be able to understand and evaluate research articles published in major journals; . To examine summaries and literature reviews within the field of applied linguistics 	3

Roadmap of BS English

Total credit hours used: 133

Semester-1 (17)

Course Code	Course Title	Credit Hours
ENG-105	Functional English (English-I)	3
PAK-100	Pakistan Studies	2
ENG-103	Introduction to Literature-1 (Drama & Poetry)	3
ENG-104	Introduction to Linguistics	3
HSS-102	Introduction to Philosophy	3
HSS-107	Introduction to Psychology	3

Semester- 2 (17)

Course Code	Course Title	Credit Hours
ENG-120	English Writing Skills(English-II)	3
ISL-100	Islamic Studies	2
HSS-111	Introduction to International Relations	3
ENG-110	History of English Literature-1 (Medieval to Romantics)	3
MAT-105	Mathematics	3
ENG-112	Phonetics and Phonology	3

Semester- 3 CR(18)

Course Code	Course Title	Credit Hours
ENG-201	Oral Communication& Presentation Skills (English-III)	3
ENG-202	Morphology and syntax-1	3
ENG-203	Introduction to Literature-2 (novel & prose)	3
BES-204	Introduction to Computer Application	3
ECO-205	Economics	3
MGT-206	Entrepreneurship	3

Semester-4 (18)

Course Code	Course Title	Credit Hours
ENG-207	Advance Academic reading &writing skills (English-III)	3
HSS-208	Human rights & citizenship	3
HSS-209	Gender Studies	3
ENG-210	Semantics	3
ENG-211	History of English Literature-2 (Romantics to Present Age)	3
QTM-212	Introduction to statistics	3

Semester-5 (18)

Course Code	Literature(Major)	Linguistics(Major)	Course Code
ENG-301	Visionary discourse (3)-compulsory	Visionary discourse (3)-compulsory	ENG-301
ENG-302	Literary Criticism (3)	Morphology and syntax-II (3)	ENG-309
ENG-303	Classical poetry (14-18 th century) (3)	Sociolinguistics (3)	ENG-310
ENG-304	Novel -1(18-19 th century) (3)	Pedagogical Grammar (3)	ENG- 311

Semester-Fall 2020CR(15)

Course Code	Literature (Major)	Linguistics (Major)	Course Code
ENG-305	Research Methodology (3)	ResearchMethodology	ENG-305
ENG-306	Literary Criticism and theory(3)	Discourse analysis (3)	ENG-312
ENG-307	Classics in drama (3)	Psycholinguistics (3)	ENG- 313
ENG-308	Romantic poetry (19-20 th century) (3)	Lexical studies (3)	ENG- 314

Semester-Spring 2021CR(15)

Course Code	Literature (core)	Linguistics (core)	Course Code
ENG-401	Contemporary literature-1(poetry& drama) (3)	Stylistics (3)	ENG-405
ENG-402	South Asian literature(3)	Language learning theories (3)	ENG-406
ENG-403	American/Canadian literature (3)	Syllabus designing and testing (3)	ENG-407
ENG-404	Translational theory and literary studies (3)	TEFEL-1 (3)	ENG-408
	Elective 1 and 2 (3+3)	Elective 1 and 2 (3+3)	

Semester-Fall2021CR(15)

Course Code	Literature (core)	Linguistics (core)	Course Code
ENG-409	Contemporary literature-2 (3)	TEFEL-2 (3)	ENG-412
ENG-410	Post-colonial literature (3)	Pragmatics(3)	ENG-413
ENG-411	Literary discourse& journalistic writing (3)	Introduction to Applied Linguistics (3)	ENG-414
	Elective Project 3 and 4 (3+3)	Elective 3 and 4 (3+3)	

NOTE:

- 3 Core are to be selected out of 4, making 9 CH. (In fourth year-spring semester).
- 2 Core are to be selected out of 3, making 6 CH.(In fourth year- fall semester)
- 2 courses are to be selected from the other specialization/stream in the 5th semester.
- 1 course is to be selected from the other specialization/stream in the 6th semester.
- University is authorized to offer any course (Core) out of the above mentioned, depending on the available expertise.
- It is mandatory for the students from Literature & Linguistics both to complete research project, of 3 CH, in final year spring semester.

Electives for literature

Course Code	Course Title	Credit Hours
ENG-515	Western Literature	3
ENG-516	World Literature	3
ENG-517	Feminist Literature	3
ENG-518	Comparative Studies	3

Electives for Linguistics

Course Code	Course title	Credit Hours
ENG-520	English for Specific Purposes	3
ENG-521	Translational Studies	3
ENG-522	English Language Teaching	3
ENG-523	Media Discourse Analysis	3

Appendage 3021**SUBJECT: Launch Proposal of MS Data Science****1. Background to the Case**

There is a growing demand for data scientists who can apply powerful tools and advanced statistical modeling techniques to make discoveries about business problems, processes and platforms. Master of Science in Data Science, MS (DS), will addresses the intersection of three areas driving data science: technologies, analytics and business needs. MS(DS) is being proposed as per requirements of Postgraduate Academic Regulations of Bahria University and HEC.

2. Recommendations

MS Data Science Program is recommended for approval.

(Road-map of MS (DS) is attached as Annex-A. Course outlines are at Annex-B.)
New Program proposal (Bahria University format) is attached.

**New Programme Proposal Form
MS DATA SCIENCE**

A. ACADEMIC DETAILS	
1	Faculty/Department: Faculty of Engineering and Sciences, Department of Computer Sciences
2	Name of the Programme: MS Data Science – MS (DS)
3	Mission of the Programme: The mission of the MSDS program is to produce data scientists who are able to apply their theoretical knowledge and analytical skills to create effective and novel solutions to practical and research oriented data science problems.
4	Objectives of the Programme: <ul style="list-style-type: none"> • To gain expertise in both theory and practices of Data Science including knowledge of contemporary data management and analysis technologies, for data collection and storage, visualisation • To gain knowledge and skills to understand and apply appropriate analytical methodologies to transform the way an organisation achieves its objectives. • To deal effectively with large data management tasks, to master the statistical and machine learning foundations on which data analytics is built • To fulfil growing needs of Data Science experts that are well equipped to contribute and lead in industry, academia and research
5	Outcomes of the Programme: The outcome of program is to prepare students for the positions in data science, i.e. data analysis and visualization. Students completing the degree will manage data-driven decision-making and use, analyse, and evaluate technologies and techniques in an enterprise setting. The graduating students will be able to: <ul style="list-style-type: none"> • Collect and manage data to devise solutions to data science tasks. • Select, apply, and evaluate models to devise solutions to data science tasks. • Interpret data science analysis outcomes.

	<ul style="list-style-type: none"> Effectively communicate data science-related information effectively in various formats to appropriate audiences Value and safeguard the ethical use of data in all aspects of their profession.
6	<p>Rationale for the Programme:</p> <p>Big data and analytics now drive strategic decision making and innovation whether it is in relation to engineering, finance, health or other professional areas. There is a growing demand for data scientists who can apply powerful tools and advanced statistical modelling techniques to make discoveries about business problems, processes and platforms. Master of Science in Data Science, MS (DS), will addresses the intersection of three areas driving data science: technologies, analytics and business needs.</p>
7	<p>Brief Description of the Programme:</p> <p>We have massive amounts of data about many aspects of our lives, and, simultaneously, an abundance of inexpensive computing power. Shopping, communicating, reading news, listening to music, searching for information, expressing our opinions—all this is being tracked online, as most people know.</p> <p>Data scientists use their data and analytical ability to find and interpret rich data sources; manage large amounts of data despite hardware, software, and bandwidth constraints; merge data sources; ensure consistency of datasets; create visualizations to aid in understanding data; build mathematical models using the data; and present and communicate the data insights/findings. They are often expected to produce answers in days rather than months, work by exploratory analysis and rapid iteration, and to produce and present results with dashboards (displays of current values) rather than papers/reports, as statisticians normally do. Data science is not only about technology and maths—effective data scientists require a combination of technical skills and soft skills to turn data into actionable insight.</p> <p>The MS(DS) program will cover foundations of data science including mathematical and statistical skills along with machine learning, data mining, data engineering and data visualization. MS(DS) program is being proposed as per requirements of Postgraduate Academic Regulations of Bahria University and HEC.</p>
8	Duration: 2 years
9	<p>Venue(s): On Site/Off Site/Both On & Off Site (<i>tick one/strike-through the ones not applicable; if Off Site, give details</i>)</p> <p>IQBAL Block, Bahria University, Shangrilla Road, Sector E-8, Islamabad</p>
10	<p>Programme Scheduling Format:</p> <ul style="list-style-type: none"> <u>Morning/Evening/Weekend</u> (<i>tick one/strike-through the ones not applicable</i>) <u>Bi-Semester/Trimester/Semester+Summer Session/Annual/Bi Annual</u> (<i>tick one/strike-through the ones not applicable</i>)
11	<p>Proposed Date of Commencement:</p> <p>Fall 2018</p>
12	Mode of study for MS Data Science is based on class room teaching. Assignments, quizzes, presentations, mid-term, and final term exams will be used to evaluate the students in each semester. Also, students will be encouraged to undertake 6 credit hours of MS thesis.
13	<p>Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>)</p> <p>None</p>
14	<p>Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>)</p> <p>None</p>
15	<p>Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>)</p> <p>Class rooms in IQBAL block are available in the evening, and initially one class room will be required at the start of the program and maximum 3 rooms will be required when the program matures.</p>

16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) There is no mandatory requirement of laboratory work for MS(DS) program and the computing Lab facilities available to the department are sufficient to execute the program.
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: None
18	Minimum Entry Level: 4 years Bachelor degree in CS/SE/CE/IT or equivalent
19	Admission Criteria: HEC recognized 4 years Bachelor degree in CS/SE/CE/IT or equivalent with CGPA 2.5/4.0 (Semester System) or 50% marks (Annual System). NTS-GAT (General)/ GRE/University entry test passed with 50% marks.
20	Additional/Different Examination Requirement (<i>Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue.</i>) No additional/different examination requirements. The examinations will be as per BU Academic Rules and Examination policy
21	Number of Admissions Expected for First Intake: 10 admissions for first intake
22	Number of Admissions Planned/Expected for Subsequent Intakes: 15 admissions per intake
23	Referred by: FBOS
24	Complete Plan of Studies, inclusive of complete Roadmap: (<i>Attach as Annex 'A'</i>)
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (<i>Attach as Annex 'B'</i>)

B. FINANCIAL DETAILS

1	Source of Funding: Tuition Fee <ul style="list-style-type: none"> • BU: Fully/Partially: • Public Sector (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • NNGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • INGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) • UN/IGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) 																																																													
2	Degree Duration: 2 years Semester System: Yes (4 Semesters) Total Number of Credit Hours: 33																																																													
3	Expected fee to be charged based on Cost & Benefits Analysis: (<i>show working</i>) Per annum fee: or Fee rate per credit hour: Rs. 5500 /-																																																													
4	Expected Number of students for 1st & 2nd Intakes: 10 & 15																																																													
5	Expected Earning from first two Intakes (B5): (<i>Show working</i>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Semester</th> <th colspan="3">Students</th> <th colspan="2">Fee per student</th> <th colspan="3">Total Fee</th> </tr> <tr> <th>Fresh</th> <th>Existing</th> <th>Total</th> <th>Fresh*</th> <th>Existing**</th> <th>Fresh</th> <th>Existing</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Fall 2018</td> <td>10</td> <td>0</td> <td>10</td> <td>77,500</td> <td>0</td> <td>775000</td> <td>0</td> <td>775,000</td> </tr> <tr> <td>Spring 2019</td> <td>10</td> <td>10</td> <td>20</td> <td>77,500</td> <td>54,500</td> <td>775000</td> <td>545,000</td> <td>1,320,000</td> </tr> <tr> <td>Fall 2019</td> <td>15</td> <td>20</td> <td>35</td> <td>77,500</td> <td>54,500</td> <td>1,162,500</td> <td>1,090,000</td> <td>2,252,500</td> </tr> <tr> <td>Spring 2020</td> <td>15</td> <td>35</td> <td>50</td> <td>77,500</td> <td>54,500</td> <td>1,162,500</td> <td>1,907,500</td> <td>3,070,000</td> </tr> </tbody> </table>									Semester	Students			Fee per student		Total Fee			Fresh	Existing	Total	Fresh*	Existing**	Fresh	Existing	Total	Fall 2018	10	0	10	77,500	0	775000	0	775,000	Spring 2019	10	10	20	77,500	54,500	775000	545,000	1,320,000	Fall 2019	15	20	35	77,500	54,500	1,162,500	1,090,000	2,252,500	Spring 2020	15	35	50	77,500	54,500	1,162,500	1,907,500	3,070,000
Semester	Students			Fee per student		Total Fee																																																								
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	* per credit 5500 with 9 credit hours including admission fee and misc. charges ** per credit 5500 with 9 credit hours including misc. charges																																																													
6	Expected Earning for the Next Five Years (B6): (<i>show working</i>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Yr</th> <th rowspan="2">Semester</th> <th colspan="3">Students</th> <th colspan="2">Fee per student</th> <th colspan="3">Total Fee</th> </tr> <tr> <th>Fresh</th> <th>Existing</th> <th>Total</th> <th>Fresh*</th> <th>Existing**</th> <th>Fresh</th> <th>Existing</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Fall 2018</td> <td>10</td> <td>0</td> <td>10</td> <td>77,500</td> <td>0</td> <td>775000</td> <td>0</td> <td>775,000</td> </tr> <tr> <td></td> <td>Spring 2019</td> <td>10</td> <td>10</td> <td>20</td> <td>77,500</td> <td>54,500</td> <td>775000</td> <td>545,000</td> <td>1,320,000</td> </tr> </tbody> </table>									Yr	Semester	Students			Fee per student		Total Fee			Fresh	Existing	Total	Fresh*	Existing**	Fresh	Existing	Total	1	Fall 2018	10	0	10	77,500	0	775000	0	775,000		Spring 2019	10	10	20	77,500	54,500	775000	545,000	1,320,000															
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	2	Fall 2019	15	20	35	77,500	54,500	1,162,500	1,090,000	2,252,500	
		Spring 2020	15	35	50	77,500	54,500	1,162,500	1,907,500	3,070,000	
	3	Fall 2020	15	40	55	77,500	54,500	1,162,500	2,180,000	3,342,500	
		Spring 2021	15	45	60	77,500	54,500	1,162,500	2,452,500	3,615,000	
	4	Fall 2021	15	45	60	77,500	54,500	1,162,500	2,452,500	3,615,000	
		Spring 2022	15	45	60	77,500	54,500	1,162,500	2,452,500	3,615,000	
	5	Fall 2022	15	45	60	77,500	54,500	1,162,500	2,452,500	3,615,000	
		Spring 2023	15	45	60	77,500	54,500	1,162,500	2,452,500	3,615,000	

Year 1: Rs. 2,095,000 /-

Year 2: Rs. 5,322,500 /-

Year 3: Rs. 6,957,500 /-

Year 4: Rs. 7,230,000 /-

Year 5: Rs. 7,230,000 /-

Total 5 years earnings: Rs. 28,835,000 /-7 **Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working)**

Semester	Course	Credit Hours	Per Semester Salary (Rs. 2200 per hour)	
			FM	
Fall 2017	3	9		316,800
Spring 2018	6	18		633,600
Fall 2018	9	27		950,400
Spring 2019	11	33		1,161,600

Year 1: Rs. 950,400.00

Year 2: Rs. 2,112,000.00

Year 3: Rs. 2,323,200.00

Year 4: Rs. 2,323,200.00

Year 5: Rs. 2,323,200.00

Total estimated salaries per annum of HR : Rs. 2,323,200 /- (per annum)8 **Cost of Additional Laboratory Equipment/Tools (B8): (show working)** **None**9 **Cost of Additional Classrooms (B9): (Include furniture, technical aids etc)** **None**10 **Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details)** **Rs. 50,000.00**11 **Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details)** **None**12 **Miscellaneous Expenses required for Starting the Program (B12):**

- Advertisement: 30,000 /-
- Printing & Stationery: None
- Admin Cost: None
- Any other: None
- **Total : 30,000 /-**

13 **Annual Recurring Expenditures in Subsequent Years (B13):**

- Salaries:
- Rentals:
- Subscriptions/Memberships:
- Advertisements:
- Printing & Stationery:
- Admin Cost
- Any other
- **Total:**

14	Total Cost of the Programme (B14): [Add B(7) to B(12)] Year 1: Rs. 1,030,400.00 Year 2: Rs. 2,112,000.00 Year 3: Rs. 2,323,200.00 Year 4: Rs. 2,323,200.00 Year 5: Rs. 2,323,200.00
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] Year 1: Rs. 1,030,400.00 Year 2: Rs. 2,112,000.00 Year 3: Rs. 2,323,200.00 Year 4: Rs. 2,323,200.00 Year 5: Rs. 2,323,200.00
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] Rs. 1,064,600 /-
17	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>) Year 2: Rs. 5,322,500 /- Year 3: Rs. 6,957,500 /- Year 4: Rs. 7,230,000 /- Year 5: Rs. 7,230,000 /-
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] Year 2: Rs. 3,210,500.00 Year 3: Rs. 4,634,300.00 Year 4: Rs. 4,906,800.00 Year 5: Rs. 4,906,800.00

Annex - A**MS(DS) - COMPLETE PLAN OF STUDY****Semester 1**

Course Code	Course Title	Credit Hours
DSC-501	Data Science Foundations	03
DSC-601	Statistics for Data Science	03
ESC-701	Research Methodology	03
	Total	09

Semester 2

DSC-701	Big Data Analytics	03
DSC-702	Machine Learning and Data Analysis	03
	Elective-I	03
	Total	09

Semester 3

	Elective-II	03
DSC-703	Data Visualization	03
THS-701/Elec-Code	Thesis-I / Elective-III	03
	Total	09

Semester 4

THS-701/Elec-Code	Thesis-II / Elective-IV	03
	Total	03
	TOTAL CREDIT HOURS	30

University Requirement

Sr. No	Course Code	Course Title	Credit Hours
1	ESC-701	Research Methodology	03

Electives

Sr. No	Course Code	Course Title	Credit Hours
1	DSC-704	Distributed Data Engineering	3
2	DSC-705	Deep Learning and Data Analysis	3
3	DSC-706	Unstructured Data Processing	3
4	CSC-701	Computer Supported Cooperative Work	3
5	SEN-720	Advanced Human Computer Interaction	3
6	SEN-756	Advanced Usability Engineering	3
7	CSC-518	Decision Support Systems	3
8	CSC-715	Intelligent Agents	3
9	CSC-741	Advanced Natural Language Processing	3
10	CEN-745	Advanced Digital Image Processing	3
11	CSC-749	Advanced Neural Networks and Fuzzy Logic	3
12	CSC-751	Pattern Recognition	3
13	CSC-764	Computer Vision	3
14	CSC-750	Intelligent Tutoring Systems	3
15	EET-519	Distributed Networking	3
16	EET-556	Mobile Communications and Networking	3
17	EET-702	Advanced Network Security	3
18	EET-761	Network Protocols and Standards	3
19	CSC-781	Cloud Computing	3
20	CSC-720	Advanced Operating Systems	3
21	CEN-720	Advanced Computer Architecture	3
22	CSC-554	Advanced Information Theory	3
23	CSC-747	Text Mining	3
24	CSC-752	Advanced DBMS	3
25	CSC-753	Distributed Databases	3
26	CSC-754	Object Oriented Databases	3
27	CSC-755	Web based DBMS	3
28	CSC-756	Multimedia Databases	3
29	CSC-760	Advanced Data Warehousing	3
30	SEN-764	Ontology Engineering	3
31	THS-701	Thesis	6

Annex – B**COURSE OUTLINES****Course Title:** **Data Science Foundations**

Course Code: DSC-501

Pre-Requisite: None

Objectives:

The objective is to cover key concepts adopted from statistics and machine learning, useful techniques for graph analysis and parallel programming, and the practical application of data science for such tasks as building recommender systems or performing sentiment analysis. The idea is to provide numerous practical case studies using real-world data to support understanding through hands-on experience of solving data science problems.

Contents:

Introduction to the infrastructure and architecture of data storage systems, with a focus on querying, exploring, understanding and transforming data features for statistical and machine learning applications. An in-depth study of basic classification, clustering and association mining techniques is also part of this course. Also describes techniques and tools for statistical analysis, machine learning, graph analysis, and parallel programming; review a range of applications of data science, including recommender systems and sentiment analysis of text data.

Text Books:

- A Simple Introduction to DATA SCIENCE: BOOK ONE by Lars Nielsen, Noreen Burlingame, 1st Edition, Publisher: New Street Communications, 2012.
- A Simple Introduction to DATA SCIENCE: BOOK TWO by Lars Nielsen, John Eastman, 1st Edition, Publisher: New Street Communications, 2015.

Reference Books:

- Data Analysis: An Introduction by Michael S. Lewis-Beck, 1st Edition, Publisher: SAGE University Papers, 2014. ISBN-13: 978-0803957725
- Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications by Laura Igual and Santi Seguí, Publisher: Springer. 2017 ISBN-13: 978-3319500164

Course Title:	Statistics for Data Science
Course Code:	DSC-601
Pre-Requisite:	None

Objectives:

This course takes a conceptual approach, helping students understand what statistics is about and learning the right questions to ask when analyzing data, rather than just memorizing procedures. The statistics is a central science in modern life and this course introduces students to that. From batting averages and political polls to game shows and medical research, the real-world application of statistics continues to grow by leaps and bounds. How can we catch schools that cheat on standardized tests? How does Netflix know which movies you'll like? What is causing the rising incidence of autism? This course focusses on such real-life applications from a statistical perspective.

Contents:

This course is an overview of core skills in linear algebra, analysis, statistics, and differential calculus with a focus on hands on applications for data science use cases. The focus is on the underlying intuition that drives statistical analysis. The idea is to clarify key concepts such as inference, correlation, and regression analysis, reveals how biased or careless parties can manipulate or misrepresent data, and shows how brilliant and creative researchers are exploiting the valuable data from natural experiments to tackle thorny questions.

Text Books:

- Statistics: The Art and Science of Learning from Data by Alan Agresti, Christine A. Franklin, Bernhard Klingenberg, W.W. Borton, Pearson, 4th Edition, 2017. ISBN-13: 978-0321997838
- Data Analytics For Beginners: Practical Guide To Master Data Analytics by T. Wart, TechWorld, 1st Edition, 2014.

Reference Books:

- Computer Age Statistical Inference: Algorithms, Evidence, and Data Science by Bradley Efron, Trevor Hastie, Cambridge University Press, 1st Edition, 2016.
- Naked Statistics: Stripping the Dread from the Data, by Charles Wheelan, W. W. Norton Company, 1st Edition, 2014. ISBN-13: 978-0393347777

Course Title:	Research Methodology
Course Code:	ESC-701
Pre-Requisite:	None

Objectives:

This course is aimed at providing the students with an ability to undertake postgraduate level research and an appreciation of relevant ethical and professional issues. After completing this course, students will be able to: Formulate research questions and carry out research investigations, identify various sources of information and critically analyze the collected information, Identify and apply appropriate research methods in order to plan, conduct and evaluate their research, effectively report/publish the results of research activities and Develop and deliver presentations to disseminate research findings.

Contents:

Introduction to research, Qualitative and Quantitative research, The scientific method of research, Choosing a research problem, Choosing a research advisor, Literature Review – Conducting and writing, Formulating the research question, Identifying variables and generating hypothesis, Research Design/Methodology, Information gathering and data collection, Data representation, analysis and interpretation, Writing a research proposal, Ethics of research – Plagiarism and Intellectual property rights, Organizing and managing conferences and workshops, Writing research papers/Reviewing research papers, Planning and delivering scientific presentations, Writing thesis/dissertations.

Text Books:

- How to Research, L. Blaxter, C. Hughes, M. Tight, 4th Edition, 2010.
- Research Methodology: A Step-by-Step Guide for Beginners, Ranjit Kumar, Publisher: SAGE,3rd Edition, 2010

Reference Books:

- Research Methodologies – A step by step guide for beginners, Ranjit Kumar, 2005.
- Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, John W. Creswell, 2008.

Course Title:	Big Data Analytics
Course Code:	DSC-701
Pre-Requisite:	None

Objectives:

Analysing data is not easy since it has to be figured out which type of data analytics are to be used, as well as defeat the challenges that come up when it comes to analysing data. This course is focussed on learning analytics for big data using real-world scenarios.

Contents:

This course covers advanced topics in big data analytics including association analysis, nearest neighbour search in high dimensional data, link analysis, page rank, dimensionality reduction, mining stream data and working with very large graphs. The risks of data analytics, the types of data analytics that are out there in the world, the benefits of using data analytics and also the real-world examples that show how to take this knowledge and apply it to everyday life.

Text Books:

- Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting by EMC Education Services (Editor), Data 1st Edition, 2015. ISBN-13: 978-1118876138
- Big Data Science & Analytics: A Hands-On Approach by Arshdeep Bahga, Vijay Madisetti, Published by VPT, 1st Edition, 2016. ISBN: 978-0996025539

Reference Books:

- Data Analytics: Become a Master in Data Analytics by Richard Dorsey, CreateSpace Independent Publishing Platform, 2nd Edition, 2017.
- Big Data Analytics by Venkat Ankam, Published by Packt Publishing, 1st Edition, 2016.

Course Title: **Machine Learning and Data Analysis**

Course Code: DSC-702

Pre-Requisite: None

Objectives:

Machine learning is the next step in artificial intelligence and it is the reason many of the daily activities people enjoy are possible. Whether it's using your voice to control your smart device or being tagged in a picture on social media, machine learning makes it possible. It is machine learning that allows for the algorithms that let the various devices, programs, and machines to actually learn and adapt. The course is about the types of machine learning such as deep learning and decision tree learning and also the incredible ways that machine learning has helped make the day to day life just a little easier.

Contents:

Essential elements of Machine Learning, with a focused introduction to core supervised and unsupervised learning algorithms, statistical modelling, and key best practice techniques for building well trained models. A data science solution implementation is also part of this course to develop implementation skills. On top of the based understanding of machine learning there are also plenty of scientific examples and datasets for you to begin practicing solving machine learning problems.

Text Books:

- Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked Examples, and Case Studies by John D. Kelleher, Brian Mac Namee, Aoife D'Arcy, MIT Press, 1st Edition, 2017. ISBN-13: 978-0262029445
- Machine Learning: Fundamental Algorithms for Supervised and Unsupervised Learning With Real-World Applications by Joshua Chapmann (Author, Publisher), 2nd Edition, 2017.

Reference Books:

- Machine Learning with R - Second Edition by Brett Lantz, Packt Publishing, Second Edition, 2015. ISBN: 978-1-78439-390-8
- Machine Learning with Python: Understanding Machine Learning with Python in the World of Data Science by Robert Wilson (Author, Publisher), 1st Edition, 2016.

Course Title: **Data Visualisation**

Course Code: DSC-703

Pre-Requisite: None

Objectives:

The course is about effective data analysis involves learning how to synthesize data, especially big data, into a story and present that story in a way that resonates with the audience. The course is about how to analyze large amounts of data, communicate complex data in a meaningful way, and quickly slice data into various views. Also, explain how to automate redundant reporting and analyses, create eye-catching visualizations, and use statistical graphics and thematic cartography.

Contents:

Students learn the skills of data visualization in parallel with the soft skills of communicating with a non-technical audience and core Data Science leadership skills. Emphasis is placed on enabling students

to listen to articulated business needs or problem cases and learn how to propose as well as execute Data Science solutions to effectively meet these needs. Further, present vast amounts of data in ways that won't overwhelm your audience.

Text Books:

- Data Visualisation: A Handbook for Data Driven Design by Andy Kirk (Author), SAGE Publishing, 1st Edition, 2017. ISBN: 978-14739-1213-7
- Effective Data Visualization: The Right Chart for the Right Data by Stephanie D. H. Evergreen (Author), SAGE Publishing, 1st Edition, 2016. ISBN: 978-1506303055

Reference Books:

- Data Visualization with Python and JavaScript: Scrape, Clean, Explore & Transform Your Data by Kyran Dale (Author), 2nd Edition, O'Reilly Media, 2017. ISBN: 978-1491920510
- Machine Learning for Absolute Beginners: A Plain English Introduction by Oliver Theobald (Author, Publisher), 1st Edition, 2017.

Course Title: **Distributed Data Engineering**

Course Code: DSC-704

Pre-Requisite: None

Objectives:

The course is about well-designed conceptual and logical data models that the design has been built with flexibility and extensibility leading to high application agility and low maintenance costs. A detailed data flow diagrams means a concrete understanding of the business' value chain exists and is documented. The wish to understand how we think means excellent team dynamics while analyzing, designing, and building the application.

Contents:

This course will introduce students to working with distributed systems for efficiently collecting and analysing large quantities of varied data. This is a survey-style course covering common data platforms and analysis patterns including Postgres (SQL), Hadoop (MapReduce), Spark, Kafka (logs), Lambda Architecture (streaming), and Cassandra (NoSQL).

Text Books:

- Data Engineering Perfect by Brian Shive, Technics Publications, LLC, 2nd Edition, 2017. ISBN: 978-1935504603
- Measurement and Data Analysis for Engineering and Science by Patrick F. Dunn (Author), CRC Press, 3rd Edition, 2016. ISBN: 978-1439825686

Reference Books:

- Data Visualization with Python and JavaScript: Scrape, Clean, Explore & Transform Your Data by Kyran Dale (Author), 2nd Edition, O'Reilly Media, 2017. ISBN: 978-1491920510
- Machine Learning with Python: Understanding Machine Learning with Python in the World of Data Science by Robert Wilson, CreateSpace Independent Publishing, 1st Edition, 2016.

Course Title: **Deep Learning and Data Analysis**

Course Code: DSC-705

Pre-Requisite: None

Objectives:

Machine learning is the next step in artificial intelligence and it is the reason many of the daily activities people enjoy are possible. Whether it's using your voice to control your smart device or being tagged in a picture on social media, machine learning makes it possible. It is machine learning that allows for

the algorithms that let the various devices, programs, and machines to actually learn and adapt. This course is the next course of machine learning and data analysis and is about advanced machine learning topics.

Contents:

Advanced topics in machine learning with focus on optimization, probability theory, multi-model ensemble techniques, time series analysis, instrumental variable analysis and reinforcement learning. A data science solution implementation is also part of this course to develop implementation skills. On top of the based understanding of deep learning there are also plenty of scientific examples and datasets for you to practicing advanced machine learning problems.

Text Books:

- MACHINE LEARNING And DEEP LEARNING For Beginners by Ronald Davis (Author)
Published by: Ronald Davis, 1st Edition 2017.
- Machine Learning: Fundamental Algorithms for Supervised and Unsupervised Learning with Real-World Applications by Joshua Chapmann (Author, Publisher), 2nd Edition, 2017.

Reference Books:

- Machine Learning with R - Second Edition by Brett Lantz, Packt Publishing, Second Edition, 2015.
ISBN: 978-1-78439-390-8
- Machine Learning with Python: Understanding Machine Learning with Python in the World of Data Science by Robert Wilson, CreateSpace Independent Publishing, 1st Edition, 2016.

Course Title: **Unstructured Data Processing**

Course Code: DSC-706

Pre-Requisite: None

Objectives:

This course is aimed at extracting useful information (usually) from huge unstructured datasets by employing techniques from information retrieval, natural language processing and data mining. The objective of this module is to get a good understanding of the basic text mining techniques and study some of its applications as well.

Contents:

Essential Data Science skills involved in working with unstructured data include transforming it into structured data types able to be analysed, processed and used for Machine Learning and Information Retrieval algorithms. The focus is on Natural Language Processing and classification techniques used in Text Mining. Dealing with information overload and information overlook, unstructured vs. (semi-) structured data, evolving information needs and knowledge management issues, the business case for text mining. The text mining pipeline: information retrieval, information extraction and data mining. Fundamentals of natural language processing: linguistic foundations, levels of linguistic analysis.

Text Books:

- Text mining handbook: advanced approaches in analyzing unstructured data, Feldman, Ronen and James Sanger, Cambridge University Press, Edition: 3rd ,2015
- Text mining: classification, clustering and applications, Srivastava, Ashok and Mehran Sahami, Chapman & Hall, Edition: 1st, 2009

Reference Books:

- Mining Text Data by Charu C. Aggarwal, ChengXiang Zhai – 2012
- Machine Learning for Absolute Beginners: A Plain English Introduction by Oliver Theobald (Author, Publisher), 2017

Course Title:	Computer Supported Cooperative Work
Course Code:	CSC-701
Pre-Requisite:	None

Objectives:

The objective of the course is to impart knowledge about synchronous and asynchronous group work, workflow management systems, organizational and technology design. After completing the course students will be able to understand cooperative work processes within socio-technical systems and supported software technology. Furthermore, students will understand the evaluation mechanisms for evaluating application systems for distributed and collaborative work.

Contents:

Social and Scientific Foundations (ethnography, Small group research, organization theory), applications to support synchronous and asynchronous cooperation, Workflow Management Systems, Media Spaces and Cooperative Virtual Environments (CVE), Functionality to promote group awareness (awareness), Coordination, ordering Systems, Customizable groupware Systems, development of methods of cooperative systems, Integrated organization and technology design.

Text Books:

- Cooperative Work and Coordinative Practices, Schmidt, Kjeld, Springer 2012
- Computer Supported Cooperative Work, M. Herczeg, Tom Gross, M. Koch, VerLag, 2007

Reference Books:

- When second wave HCI meets third wave challenges, S. Bødker, ACM Press, 2006.
- Designing Collaborative Systems: A Practical Guide to Ethnography, Andy Crabtree, Springer, 2003.

Course Title:	Advanced Human Computer Interaction
Course Code:	SEN-720
Pre-Requisite:	Human Computer Interaction

Objectives:

The objective of this course is to highlight the importance if user interfaces design. Students will be able to learn different design theories and organizational aspects revolving around human computer interaction. After the completion of the course students will be able to employ best practices for better user interface design.

Contents:

Fundamentals of interaction design from perception, working and cognitive Psychology, theories of design: Distributed Cognition, Activity Theory, structuration theory, Text, Image, video, audio and animation Job Analysis, Basics of tasks and basic technologies: web-based systems, peer-to-peer systems, Fundamentals of Software and Media Ergonomics, methods of user-centered interaction design, Organizational aspects of the design of complex interactions.

Text Books:

- Interaction Design: Beyond Human-Computer Interaction, Jenny Preece, Helen Sharp, Yvonne Rogers, Wiley Pub, 4th edition, 2015
- Human Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, Julie A. Jacko, CRC Press, 2012

Reference Books:

- Human-Computer Interaction: An Empirical Research Perspective, I. Scott MacKen, Morgan Kaufmann Pub, 2013

- Human-Computer Interaction: The Fundamentals Made Easy, Solis Tech, CreateSpace Independent Publishing, 2016

Course Title: **Advanced Usability Engineering**
Course Code: SEN-756
Pre-Requisite: Human Computer Interaction

Objectives:

In this course students will learn the skills of usability engineering, ethnographic research methods for data collection as well as evaluation strategies such as heuristics evaluation and user studies. Furthermore different design paradigms, different Schools of thought and the interplay of technology, people and the environment will be discussed.

Contents:

Ethnographic methods to study the context of use, Usability Engineering Lifecycle, Narrative approaches to the understanding of future uses, methods of heuristic evaluation of the usability interactive system, Empirical methods for evaluating the usability of interactive systems under controlled conditions, Usability Testing, Skills of test moderator, Setting up testing environment, Variations in standard testing procedures, Designing user experience.

Text Books:

- Advances in Usability Evaluation, Francesco Rebelo, Marcelo M. Soares, CRC Press, 2012
- Dana Chisnell, Jeffrey Rubin, Jared Spool: Handbook of Usability Testing - How to Plan, Design, and Conduct Effective Tests, Wiley, 2008

Reference Books:

- Fieldwork for Design - Theory and Practice, Randall, Dave, Harper, Richard, Springer, 2007.
- Scenario-Based Development of Human-Computer Interaction. Morgan Kaufmann, 2001

Course Title: **Decision Support Systems**
Course Code: CSC - 518
Pre-Requisite: None

Objectives:

This course should enable a student to understand managerial decisions, to participate in the decision making process, and to be able to develop models and systems to support the decision making. This course focuses on the use and application of information systems to support the decision-making process. Different types of systems are discussed as a basis for designing and developing highly effective decision support systems. Data models, interactive processes, knowledge-based approaches and integration with database systems are also described. Theoretical concepts would be applied to real-world applications.

Contents:

Decision support systems overview, Decision Making, Systems, Modelling, and Support, business intelligence, Data Management, Modelling and Analysis, Decision Support System Development, Fundamentals of Expert Systems and Intelligent Systems, Collaborative Computing Technologies, Knowledge Management.

Text Books:

- Decision Support Systems and Intelligent Systems, Efraim Turban and Jay E. Aronson, Prentice Hall Pub, 7th Edition, M 2004.

- Decision Support Systems and Business Intelligence Systems. Dursun Delen, Efraim Turban, Ramesh Sharda, Pearson Pub, 2013.

Reference Books:

- Machine Learning with Python: Understanding Machine Learning with Python in the World of Data Science by Robert Wilson (Author, Publisher), 1st Edition, 2016.

Course Title: **Intelligent Agents**
Course Code: CSC-715
Pre-Requisite: None

Objectives:

The primary objective of this course is to provide an introduction to the basic principles and applications of intelligent agents. The emphasis of the course is on teaching the fundamentals, and not on providing a mastery of specific commercially available software tools or programming environments. Students will be presented with a wide range of theories of relevance to their research and development to model agent's knowledge representation and learning. Emphasis will be placed on understanding concepts of thinking, planning and learning aspects of intelligent agents and using them to model and build relevant agent-based systems.

Contents:

Agent, Environment, Interaction, Solving Problem by Search Algorithms, Informed Search, Constraint Satisfaction Problem, Logical Agents, Theorem Proving Algorithms (propositional logic, predicate logic), Partial Order Planning, Graph Plan, BDI Agents, Decision trees, Neural Networks, Reinforcement learning, Q- learning, Temporal Difference Learning, Monte Carlo Methods.

Text Books:

- Artificial Intelligence, A modern Approach, Stuart Russel and Peter Norvig, Prentice Hall, 3rd Edition, 2009.
- Knowledge Representation, reasoning, and the design of Intelligent Agents, Yulia Kahl, Michael Gelfond, Cambridge University Press, 2014

Reference Books:

- Logic Based Artificial Intelligence, Jack Minker, Springer, 2000
- Reasoning about Rational Agents, Michael J. Wooldridge, MIT Press, 2003

Course Title: **Advanced Natural Language Processing**
Course Code: CSC-741
Pre-Requisite: None

Objectives:

This course is intended to introduce the students to the fundamental concepts and ideas in natural language processing (NLP). Students will be acquainted with the algorithms available for the processing of linguistic information as well as the underlying computational properties of natural languages. By the end of this course the student should be able to carry out independent work with modern techniques for processing of texts.

Contents:

Introduction to NLP and its applications, Grammar checkers, dictation, document generation, NL interfaces, The different analysis levels used for NLP, Markup, Finite state automata, Recursive and augmented transition networks, Lexical level: Error-tolerant lexical processing (spelling error correction), Transducers for the design of morphologic analyzers, Part-of-speech tagging,

Representations for linguistic resources, Syntactic level: Grammars (e.g. Formal/Chomsky hierarchy, DCGs, systemic, case, unification, stochastic), Parsing (top-down, bottom-up, chart (Earley algorithm), CYK algorithm), Semantic level: Logical forms, Ambiguity resolution, Semantic networks and parsers, Procedural semantics, Montague semantics, Vector Space approaches, Pragmatic level: Knowledge representation, Reasoning, Plan/goal recognition, Speech acts/intentions, Natural language generation.

Text Books:

- Handbook of Natural Language Processing, Nitin Indurkha and Fred J. Damerau, Chapman & Hall/Crc, Second Edition, 2010.
- Natural Language Processing and Text Mining, Anne Kao and Steve R. Poteet, Springer, 2010.

Reference Books:

- Speech & Language Processing, Daniel Jurafsky & James H. Martin, Pearson Prentice Hal, 2nd Edition, 2008.
- Foundations of Statistical Natural Language Processing, Christopher D. Manning, Hinrich Schuetze, The MIT Press; 1st edition, 1999.

Course Title: Advanced Digital Image Processing

Course Code: CEN-745

Pre-Requisite: None

Objectives:

This course will provide mathematical foundations and practical techniques for digital manipulation of images, image acquisition, pre-processing, and segmentation. The course will expose the students to the basic theory and algorithms widely used in digital image processing. After the completion of this course the students will be able to understand the basic concepts behind the processing of digital images as well as various techniques of filtering/processing images in spatial as well as in frequency domain. The course will serve as the basis for more advance topics in Computer Vision.

Contents:

Introduction to Digital Image Processing Computer Vision and Pattern Recognition, Fundamentals Element of visual Perception, Image Sensing and Acquisition Image Sampling and Quantization. Pixel operations, linear & Non linear operations, Image Enhancement in spatial Domain: Background, Grey level Transformations, Filtering in spatial domain. Image Enhancing in Frequency Domain: Frequency domain, Fourier Transform, Filtering in frequency domain, Color Image Processing, Fundamentals of Image Compression, Lossless and lossy compression, Image Compression standards, Image Segmentation: Detection of Discontinuities, Edge and Boundary detection, Thresholding, Region Based segmentation, Morphological image processing, Representation schemes: Boundary and region descriptors.

Text Books:

- Digital Image Processing, R. C. Gonzalez and R. E. Woods, Addison Wesley, 3rd Edn., 2007.
- Fundamentals of Digital Image Processing: A Practical Approach with Examples in Matlab, Chris Solomon and Toby Breckon, 2011.

Reference Books:

- Machine Learning with Python: Understanding Machine Learning with Python in the World of Data Science by Robert Wilson (Author, Publisher), 1st Edition, 2016.

Course Title: Advanced Neural Networks and Fuzzy Logic

Course Code: CSC-749

Pre-Requisite: Artificial Intelligence

Objectives:

This course presents an overview of the theory and applications of artificial neural network and fuzzy systems to computer science and software engineering applications. The objective of this course is on the understanding of various neural network and fuzzy systems models and the applications of these models to solve computing/software engineering problems.

Contents:

Artificial Intelligence Artificial Neural Network overview, Supervised Learning: Single-Layer Networks , Perceptrons , Adalines Supervised Learning: Multi-Layer Networks, Multi-Layer Perceptrons (MLPs) , Backpropagation , Conjugate Gradient method , Levenberg-Marquardt (LM) method , Madalines , Radial-Basis Networks , Cascade-Correlation Networks , Polynomial Networks , Recurrent Networks (Time series , Backpropagation through time , Finite Impulse Response (FIR) MLP), Temporal Differences method (TD). Unsupervised Learning, Simple Competitive Networks: Winner-take-all | Hamming network , Learning Vector Quantization (LVQ), Counterpropagation Networks (CPN) , Adaptive Resonance Theory (ART) , Kohonen Self-Organizing Maps (SOMs) , Principal Component Analysis networks (PCA), Associative Models, Linear Associative Memory (LAM) , Hopfield Networks , Brain-State-in-a-Box , BSB , Boltzmann Machines and Simulated Annealing , Bi-Directional Associative Memory (BAM), Optimization Problems, Neural Network Approaches, Evolutionary Programming , Fuzzy logic and its connection to NNs.

Text Books:

- Neural networks: methodology and applications, by G. Dreyfus, Springer, 2005
- Evolving Fuzzy Systems - Methodologies, Advanced Concepts and Applications, By Edwin Lughofer, Springer, 2011.

Reference Books:

- Neural Networks: A Comprehensive Foundation, Simon Haykin, Prentice Hall, 2nd Edition, 1999.
- Artificial neural networks: an introduction, by Kevin L. Priddy, Paul E. Keller, SPIE Press, 2005.

Course Title: **Pattern Recognition**

Course Code: CSC-751

Pre-Requisite: None

Objectives:

The goal of this course is to provide an introduction to the fundamental concepts of machine learning and pattern recognition with examples from several application areas. The students will be acquainted with real world regression and classification problems and the models and classifiers to solve these problems. Students will also be introduced to dimensionality reduction and feature selection concepts. Additionally, students will be exposed to various clustering techniques. A key objective to this course is for the students to also acquire hands-on experience related to classification and clustering tasks.

Contents:

Introduction to Pattern recognition and Machine learning, Matrices and vectors: Toeplitz and Vendermonde matrices, classification and regression, Bayesian Decision theory, Normal Density and decision functions for normal distribution, Maximum likelihood estimation, Dimensionality reduction – Component analysis, feature selection, Hidden Markov Models and Artificial neural networks, Non-parametric methods, Unsupervised learning and clustering: Clustering techniques.

Text Books:

- The Elements of Statistical Learning, Trevor Hastie, Robert Tibshirani and Jerome Friedman, Springer, 2009.

- Pattern Recognition and Classification: An Introduction, by Geoff Dougherty, S. Theodoridis & K. Koutroumbas, Academic Press, 2012.

Reference Books:

- Pattern recognition and Machine Learning, Christopher M. Bishop, Springer, 2007.
- Introduction to Machine Learning, Ethem Alpaydin, MIT Press, 2004.

Course Title: Computer Vision
Course Code: CSC-764
Pre-Requisite: None

Objectives:

By the end of this course, the students would have developed an understanding of the problems in simulating human perception into machines. Students will have a thorough understanding of the state of the art computer vision methods, algorithms and results. The students will also be able to apply the tools and techniques learned to solve practical vision related problems.

Contents:

Introduction to Computer Vision and related areas along with applications, Image formation and representation: imaging geometry, digitization, cameras and projections, rigid and affine transformations, Filtering: convolution, smoothing. Segmentation: region splitting and merging; quadtree structures for segmentation; Feature detection: edge detection, corner detection, line and curve detection, SIFT and HOG descriptors, shape context descriptors. Model fitting: Hough transform, line fitting, ellipse and conic sections fitting, algebraic and Euclidean distance measures. Camera calibration: camera models; intrinsic and extrinsic parameters; affine, and perspective camera models. Epipolar geometry: introduction to projective geometry; epipolar constraints; the essential and fundamental matrices; Motion analysis: the motion field of rigid objects; motion parallax; optical flow, the image brightness constancy equation, affine flow; differential techniques; feature-based techniques; Motion tracking: the Kalman filter; Object recognition and shape representation.

Text Books:

- Computer Vision: Algorithms and Applications, R. Szeliski, Springer, 2011.
- Computer Vision: A Modern Approach, D. Forsyth and J. Ponce, Prentice Hall, 2nd ed., 2011.

Reference Books:

- Computer Vision: A Modern Approach, By David Forsyth, Jean Ponce, Prentice Hall, 2003.
- Handbook of Mathematical Models in Computer Vision, By Nikos Paragios, Yunmei Chen, Olivier Faugeras, Birkhäuser, 2006

Course Title: Intelligent Tutoring Systems
Course Code: CSC-750
Pre-Requisite: None

Objectives:

The goal of this course is to survey the scientific literature pertaining to intelligent tutoring systems and design a tutoring system for functional dependencies encompassing an exercise module, a learning action tracking module, a self-assessment module for the learner and an assessment module for the educator. Data mining techniques will be used on well-designed activity logs to extract patterns to provide feedback to learners for self-assessment and global patterns for group assessment.

Contents:

An Intelligent tutoring system (ITS) provides individualized computer-based instruction to students. These systems emerged from application of artificial intelligence techniques to the computer aided instruction CAI systems. The difference is that an ITS usually compares the student's work with expert solutions or strategies, models the student's probably knowledge of a domain and provides coaching or advice, taking into account what the student's knowledge of state, preferred learning style, etc.

Text Books:

- Advances in Intelligent Tutoring Systems by Roger Nkambou, Jacqueline Bourdeau, Springer, 2010
- Intelligent Tutoring Systems, Micarelli, Alessandro, Stamper, John, Panourgia, Springer Press, 2016

Reference Books:

- Intelligent Tutoring Systems in E-Learning Environments, Stankov, Slavomir, IGI Global, 2010

Course Title: **Distributed Networking**

Course Code: EET-519

Pre-Requisite: None

Objectives:

The objective is to give students a clear overview of the problems and issues that must be dealt with in constructing robust and flexible distributed applications as well as the underlying network protocols needed to support them. The emphasis is on the conceptual basis for distributed and networked systems rather than a detailed study of particular systems and standards. Concepts will be illustrated with examples from practical systems.

Contents:

Network Overview: interfaces, protocols and services, connection-oriented and connectionless services, Overview of distributed system architecture: motivation, system structures, ODP Reference model and distribution transparencies, design issues.; Interaction primitives: message passing, remote procedure call, remote object invocation; Internet Network Measurement, Network Restoration, Routing; Multicast Routing, TCP/IP; Linux Networking and related kernel, Linux-based Content Switch Design; Intel IXP Network Processor and related IDE, MLPS, IS, RSVP, Differential Services; Overview of wide area network design Erlang, 2 node voice network design, 3 node data network design; Graph Theory, Traffic and Cost Generators, Access network design; Multispeed Access Design, Multicenter Local Access Design; Mesh Network Design.

Text Books:

- Distributed Networks: Intelligence, Security, and Applications by Qurban A. Memon, CRC Press, 2016
- Distributed Computing: Principles, Algorithms, and Systems, Ajay D. Kshemkalyani, Mukesh Singhal, Cambridge Press, 2011

Reference Books:

- Distributed Network Systems: from concepts to implementation, Weijia Jia, Springer, 2006

Course Title: **Mobile Communication and Networking**

Course Code: EET-556

Pre-Requisite: None

Objectives:

This course focuses on network issues for Mobile communication networks. The course will cover basic theory, namely the analysis of queues and combinatorial algorithms, and it will also include an overview

of the plethora of wireless mobile communications systems under development and deployment, ranging from indoor systems to satellite personal communication systems.

Contents:

History of mobile communications, fundamental definitions, characteristics of mobile communication systems, some current and proposed systems/standards. Characterization of the mobile communication channel: path loss, multipath fading, shadowing, Doppler shift, mathematical channel models, channel measurement. Techniques used for communication over fading multipath channels: forward error correction coding and interleaving, adaptive equalization, and diversity techniques. Cell layout, cell sectorization and cell splitting, Establishment of calls, handoff and power control, registration and location updating, security. Signaling between the mobile terminal and the network. Frequency reuse factor vs. inter-station distance for hexagonal grid, impact on system capacity, impact of sectorization on capacity. Erlang capacity. Specific topics include: Poisson processes and continuous-time, discrete state Markov models, Architecture of existing mobile communication systems and potential future systems Services, call flow scenarios in GSM including handoffs. Detail design and comparison of GSM and Mobile WiMax, mobile ad hoc networks including wireless sensor communication, mobile communication with satellites.

Text Books:

- James E. Katz, Handbook of Mobile Communication Studies, 2008
- Christopher Cox, An Introduction to LTE: LTE, LTE-Advanced, SAE and 4G Mobile Communications, 2012

Reference Books:

- Jochen H. Schiller, Mobile Communications, 2nd Edition, 2003
- Sassan Ahmadi, Mobile WiMAX: A Systems Approach to Understanding IEEE 802.16m Radio Access Technology, 2010

Course Title: Advanced Network Security

Course Code: EET-702

Pre-Requisite: None

Objectives:

The goal of this course is to provide fundamental concepts regarding network security. The course is designed to highlight the importance of network security using real world scenarios. In order to counter measure the attacks the data students will be familiarized with widely applicable symmetric and asymmetric encryption schemes, data integrity measures and user authentication protocols. Also, important application, transport and network layer security standards and techniques will be taught in this course. At the end of this course, the students will be able to understand the architecture and operation of network security measures for protecting networks from common attacks.

Contents:

Computer and network security definitions, basic concepts: security attacks, TCP/IP & OSI model, security services, threats in networks, security in networks, block cipher principles: DES, AES, block cipher operation, random numbers and stream ciphers, public key cryptography: RSA, Diffie-Hellman key exchange, data integrity measures: hash functions, SHA, message authentication code: MAC, HMAC, DAA and CMAC, digital signature standard, key management and distribution using symmetric and asymmetric encryption, X.509 Certificates, public key infrastructure, user authentication using symmetric and asymmetric encryption, Kerberos, transport level security, SSL, TLS, HTTPS, electronic mail security, PGP, S/MIME, network layer security: IPsec, wireless LAN security protocols, network security measures: firewalls and IDS.

Text Books:

- Cryptography and Network Security, William Stallings, Fifth Edition, Pearson Education, 2011.

- Security in Computing, Charles P. Pfleeger and Shari P. Pfleeger, Fourth Edition, Pearson Education, 2011.

Reference Books:

- Network Security Technologies and Solutions, M Yusuf Bhajji, Pearson Education, 2008
- Network Security, Private Communication in a Public World, C. Kaufman, Prentice Hall, 2002

Course Title: **Network Protocols and Standards**
Course Code: EET-761
Pre-Requisite: None

Objectives:

This course covers the Network Protocols and Standards used by various entities in an end-to-end Internet connection. Specifically, Transport, Medium Access Control, and Routing Protocols are discussed.

Contents:

Introduction, IEEE 802 LANs and LAN addressing, Protocol type multiplexing, Basic bridging concepts, Transparent Bridging, Transparent Bridges, Learning process, Spanning tree algorithm, BPDUs, Forwarding and blocked states, Root and designated bridges, Learning after STA, Aging, Bridge topology changes, Failures and additions, Bridge settable parameters, Avoiding temporary loops in spanning tree recalculation, Source routing bridges, SR-TB, SRT bridges, Traffic class expediting in 802.1D, Dynamic multicast filtering in IEEE 802.1D Basic and extended filtering services, GARP and GMRP, State machine for GARP's simple applicants, GARP information propagation (GIP), Virtual bridged LANs (VLANs) VLAN tags (VLAN IDs), VLAN registration and GARP VLAN registration (GVRP), Learning process, IPv4, Proxy ARP, ICMP, NAT BOOTP, BOOTP message format, DHCP, DHCP state machine, Interior gateway protocols, RIP Version2, OSPF, EGP, CIDR, Steiner trees MOSPF , PIM (SM and DM)

Text Books:

- Packet Guide to Core Network Protocols, Bruce Hartpence, O'Reilly Media, 1st edition, 2011
- The Future of Wireless Networks: Architectures, Protocols, and Services, Mohsen Guizani, Hsiao-Hwa Chen, Chonggang Wang, CRC Press, 2015

Reference Books:

- Network Security Essentials Applications and Standards, William Stallings, 5th edition, 2013
- Protocols and Architectures for Wireless Sensor Networks, Holger Karl, Andreas Willig, WileyPub, 1st edition, 2007

Course Title: **Cloud Computing**
Course Code: CSC-781
Pre-Requisite: None

Objectives:

Understanding the systems, protocols and mechanisms to support cloud computing, Application architectures for cloud computing, understanding the hardware necessary for cloud computing and design and implementation of cloud computing application

Contents:

This course introduces students to the cloud and the computing on the cloud. Initially, the focus is on the technology context, i.e. multi-core architectures, virtualization, parallel computing models and big

data storage. Next, famous cloud computing models including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS) are studied with the help of Amazon AWS (IaaS), Microsoft Azure (PaaS) and Google App Engine (SaaS). In addition to computing models, Data and computation models, e.g. MapReduce, are an important part of this module. The theoretical concepts are explained with hand-on experience of cloud platforms supported by case studies. The course concludes with an insight into the cloud risk areas including risks with service provider, technical risks, security issues, connectivity issues, etc. and research work in these areas is also discussed.

Text Books:

- Handbook of Cloud Computing, Borko Furht. Springer, 2010.
- Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security, and More, Kris Jamsa Jones & Bartlett Publishers, 2012

Reference Books:

- Cloud Computing and SOA: Convergence in your enterprise, David Linthicum. Addison Wesley, 2009
- Distributed File Systems: Hadoop, Lustre, Google File System, Andrew File System, Off system, Distributed File System, Ceph. General books LLC, 2010

Course Title: Advanced Operating System

Course Code: CSC-781

Pre-Requisite:

Objectives:

The operating systems course is of prime importance in the curriculum of any graduate or undergraduate program in computer science. This course deals with advance concepts with relevance to the graduate level study. The intension is to deliver the state of art operating system concepts ranging from embedded micro kernels to popular platforms like LINUX, SOLARIS, Windows 2000 and XP. The internals, architecture, device driver writing and the distributed processing support on multi-processor systems are the focus of course.

Contents:

The course builds on the features of state of art Operating Systems like multi-threading, scheduling and Inter process communication models, Concurrent programming and deadlock issues in multi core processor support. The Virtual Memory Management vs Distributed Shared Memory, Dynamic File systems and information security mechanisms along with distributed coordination principles and mechanisms of distributed file systems supported by case studies of NFS, ANDREW, Google file systems etc are covered in detail with exposure to areas of research. Device Drivers development fundamentals under Linux and Windows NT / XP operating systems and device management with specific reference to multimedia and real time operating systems are discussed. Case studies include: LINUX Kernel and services architecture, Windows XP operating system a study of Kernel features, multi-processing, memory management and services architecture and Solaris operating system features. Evaluation of operating system performance, Queuing theory, Markov processes, Bench marking, Simulation and testing methods are discussed.

Text Books:

- Modern Operating Systems, by Andrew S. Tanenbaum, Herbert Bos, Pearson, 5th edition, 2016.
- Operating Systems: Internals and Design Principles, Stallings, 7th edition, Pearson, 2013.

Reference Books:

- Operating System Concepts, Windows XP Update, Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Wiley, 2002.

- Principles of Modern Operating Systems, Jose M Garrido and Richard Schlesinger, Jones & Bartlett Learning, 2011

Course Title: **Advanced Computer Architecture**
Course Code: CEN-720
Pre-Requisite: Computer Architecture

Objectives:

This course covers the advanced concepts in computer architecture including computer organization instruction set design principles and MIPS architecture, principles of scalable performance, pipelining, instruction level parallelism, compilers, code optimization, caches, main and virtual memory. Students will also be introduced to parallel computers and storage devices.

Contents:

Computer Organization review, Instruction Set Design principles and MIPS architecture, Principles of Scalable Performance, Speedup Performance laws, Scalability analysis and approaches, Pipelining: Basic pipelining, Data and control Hazards, Exceptions, Branch Prediction, Speculation, Performance Evaluation, Instruction level Parallelism, Score Board Architecture, Dynamic Scheduling ,Multiple instruction issue using superscalar approach,VLIW – software based ILP ,Compilers and code optimization, Caches, Cache basics, Techniques to reduce miss rate, Techniques to reduce miss penalty, Programming for memory performance, Main memory organization, Virtual Memory and paging, Storage devices, Parallel Computers, Multiprocessors, Parallel Architectures and applications, Synchronization Mechanisms.

Text Books:

- Computer Architecture, Fifth Edition: A Quantitative Approach, John L. Hennessy and David A. Patterson, Morgan Kaufmann Pub, 5th Edition, 2011.
- Modern Processor Design: Fundamentals of Superscalar, John Paul Shen, Mikko H. Lipasti, Waveland Press, 2013.

Reference Books:

- Advanced Computer Architecture, Kai Hwang, McGraw Hill, 2008
- Advanced Computer Architecture, R. C. Dubey, S Chand & Co Ltd Pub, 2010

Course Title: **Advanced Information Theory**
Course Code: CSC-554
Pre-Requisite: None

Objectives:

This course presents the advance concepts of Information Theory, that stays at the basis of modern digital communications, data compression, lossy source coding and multiuser networks. Details of what computer scientists mean by "information", including topics in data compression (such as zip files and mp3), error correcting codes, information entropy, cryptography, and randomness.

Contents:

Asymptotic Equipartition Theorem, types, and typical sequences, Information measures and their properties: entropy, Kullback-Leibler divergence, mutual information, source coding theorem, channel coding theorem, rate distortion theory, quantization, maximum entropy principle Typical sequences and typical sets, error exponents in: hypothesis testing, source coding, and channel coding, information theory and estimation, rudiments of network information theory.

Text Books:

- Information Theory: A Tutorial Introduction, James V Stone, Sebtel Press, 2015
- Entropy and Information Theory, Robert M. Gray, Springer, 2011

Reference Books

- Stochastic Models, Information Theory, and Lie Groups: Analytic Methods and Modern Applications, Gregory S., Chirikjian, Birkhauser Pub, 2011
- Information theory: coding theorems for discrete memoryless systems, Csiszar and J. Korner, Cambridge University Press, 2nd edition, 2011.

Course Title:	Text Mining
Course Code:	CSC-747
Pre-Requisite:	Data Mining

Objectives:

Text Mining is aimed at extracting useful information (usually) from huge unstructured datasets by employing techniques from information retrieval, natural language processing and data mining. The objective of this module is to get a good understanding of the basic text mining techniques and study some of its applications as well.

Contents:

Dealing with information overload and information overlook, unstructured vs. (semi-) structured data, evolving information needs and knowledge management issues, the business case for text mining. The text mining pipeline: information retrieval, information extraction and data mining. Fundamentals of natural language processing: linguistic foundations, levels of linguistic analysis. Approaches to text mining: rule-based vs. machine learning based vs. hybrid; generic vs. domain specific; domain adaptation. Dealing with real text: text types, document formats and conversion, character encodings, markup, low-level processes (sentence splitting, tokenization, part of speech tagging, chunking). Information extraction: term extraction, named entity recognition, relation extraction, fact and event extraction; partial analysis vs. full analysis. Data mining and visualisation of results from text mining. Evaluation of text mining systems: evaluation measures, role of evaluation challenges, usability evaluation, the U-Compare initiative. Text mining applications and services; case studies.

Text Books:

- Text mining handbook: advanced approaches in analyzing unstructured data, Feldman, Ronen and James Sanger, Cambridge University Press, Edition: 2nd ,2008
- Text mining: classification, clustering and applications, Srivastava, Ashok and Mehran Sahami, Chapman & Hall, Edition: 1st edition , 2009

Reference Books:

- Mining Text Data by Charu C. Aggarwal, ChengXiang Zhai, Springer, 2012
- The Text Mining Handbook: Advanced Approaches in Analyzing Unstructured Data, Ronen Feldman and James Sanger, Cambridge University Press, 2006

Course Title:	Advanced DBMS
Course Code:	CSC-752
Pre-Requisite:	Database Management System

Objectives:

At the end of this course, the expectation is that the students will gain competence in following areas: Databases beyond relational, Query optimization, Data marts, Data warehousing, XML, OLAP.

Contents:

Object-Oriented Databases, Object-Relational Databases, Mobile Databases, Temporal, Spatial and Geographic Databases, Distributed Database Design, Distributed Multimedia Database Systems, Data Warehouse and OLAP Systems, Business Intelligence, XML Data Models, XML Documents and DTD, XML Query Languages, Current Research and Development Trends of Database Analysis, Design, Modeling and Applications.

Text Books:

- Advanced Database Management Systems by Rini Chakrabarti, Shilbhadrā Dasgupta, Wiley, 2011
- Advanced Database Indexing, Yannis Manolopoulos, Yannis Theodoridis, Vassilis Tsotras, Springer, 2012

Reference Books:

- Database Systems: Design, Implementation, & Management, Carlos Coronel, Steven Morris, Cengage Learning Pub, 11th edition, 2014
- An Advanced Course in Database Systems: Beyond Relational Databases, S. W. Dietrich and S.D. Urban, Prentice Hall, 2005.

Course Title: **Distributed Databases**

Course Code: CSC-753

Pre-Requisite: Database Management System

Objectives:

Be familiar with the currently available models, technologies for and approaches to building distributed database systems; have developed practical skills in the use of these models and approaches, so that they will be able to select and apply the appropriate tools for a particular case; be aware of the current research directions in the field and their possible outcomes; be able to carry out research and be able to apply learned skills to solving practical distributed database related tasks.

Contents:

Distributed database architecture, Distributed database design, Distributed query processing, Query decomposition and optimization of distributed queries, Distributed transaction management and concurrency control, Distributed DBMS reliability, Distributed database operating systems, Distributed multi-database systems, Client/Server database systems.

Text Books:

- Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, Maintainable Systems, Martin Kleppmann, O'Reilly Media, 2017
- Principles of Distributed Database Systems, M. Tamer Özsu, Patrick Valduriez, Springer, 3rd edition, 2011

Reference Books:

- Distributed Database Management Systems: A Practical Approach, Saeed K. Rahimi, Frank S. Haug, Wiley, 2011
- Database Systems Design, Implementation, and Management, Coronel, Morris & Rob, Cengage Learning Pub, 9th edition, 2011

Course Title: **Object Oriented Databases**

Course Code: CSC-754

Pre-Requisite: Database Management System

Objectives:

The course covers a variety of techniques encountered in complex mission critical applications today and guides students through the best practices of complex system development. Particular attention is given to topics that present the most productive solutions and identify approaches that may cause deficiencies during the lifetime of the system. In addition, the course covers areas of object storage and retrieval, distributed systems, business rules and objects and introduces architecture for supportable systems.

Contents:

Introduction to Object-Oriented Databases (General Issues, Concurrency Control, Transactions, Triggers and Notifiers, Distribution, Versions and Configurations), Data Model Issues (Object Identity, Data Models, Inheritance, Polymorphism, Genericity, Extensibility, Integrity Constraints, Composition, Relationship Support, Access to Meta-information, Data Sharing, Authorization), Language Issues (Persistence, Impedance Mismatch, Software Engineering Issues, Host Languages), Query Issues (Query Language, Indexing, Query Optimization), Database Evolution (Schema Changes, Effects of Changes, Database Conversion), Storage Management (Storage Schemes, Buffer Management, Clustering, Interoperability), Research Issues in Object Oriented Databases

Text Books:

- Introduction to Object-Oriented Databases, Won Kim, MIT Press, 2008
- Index Data Structures in Object-Oriented Databases, Thomas A. Mueck, Martin L. Polaschek, Springer, 2012

Reference Books:

- Database Systems: Design, Implementation, & Management, Carlos Coronel, Steven Morris, Cengage Learning Pub, 11th edition, 2014
- Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems, Martin Kleppmann, O'Reilly Media, 2017

Course Title: **Web based DBMS**

Course Code: CSC-755

Pre-Requisite: Database Management System

Objectives:

Web based databases are the most common form to databases in the modern era. It is important to have a deep understanding of Web based DBMS for the design of efficient corporate web systems. Client Server database design, issues and challenges are basic focus of the course.

Contents:

This course introduces concepts, techniques, technologies and APIs for web application development, the main focus of the course is on the Model-View-Controller design pattern employed by modern full-stack web frameworks. Concepts and techniques covered include client/server designs, database abstraction APIs, and asynchronous javascript. Examples of full-stack MVC frameworks include Ruby-on-Rails (written in Ruby), Django and TurboGears (written in Python)

Text Books:

- Developing Windows-Based and Web-Enabled Information Systems, Nong Ye, Teresa Wu, CRC Press, 2014
- Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data, Bing Liu, Springer Pub, 2011

Reference Books:

- Oracle 11g: SQL John Casteel Second Edition Cengage, 2009

- Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems, Martin Kleppmann, O'Reilly Media, 2017

Course Title: **Multimedia Databases**
Course Code: CSC-756
Pre-Requisite: Database Management System

Objectives:

Overview of Relational and Object-Relational Data Representations; Text/Document Databases; Multidimensional Data Structures, similarity based search (spatial, image, audio); XML Databases; Temporal Data Models; Logical Frameworks.

Contents:

Introduction to Multimedia Databases, Multimedia Data, The Human Sensory System and Multimedia, An Introduction to SQL and Multimedia, Querying Multimedia Data, Modeling Multimedia Databases, Using Multimedia Metadata, Multimedia Database Architecture and Performance, Multimedia and the Internet, Dealing with Text Databases Dealing with Image Databases, Dealing with Video Databases

Text Books:

- Intelligent Big Multimedia Databases by Andreas Wichert, World Scientific Publishing, 2015
- Advanced Multimedia and Ubiquitous Engineering: Future Information Technology, James J. Park, Han-Chieh Chao, Hamid Arabnia, Neil Y. Yen, Springer, 2015

Reference Books:

- Databases and Transaction Processing, An Application-Oriented Approach, Philip M. Lewis, Arthur Bernstein, and Micheal Kifer, Addison Wesley Publishers, 2002.
- Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems, Martin Kleppmann, O'Reilly Media, 2017

Course Title: **Advanced Data Warehousing**
Course Code: CSC-760
Pre-Requisite: None

Objectives:

By the end of this course students will be familiar with concepts of Data Warehousing including: Strategic need of data warehousing, Building blocks of a data warehouse, Data warehouse project management, Business requirements of a data warehouse, Architectural components of a data warehouse, Data warehouse metadata management, Dimensionality Modeling, ETL & Data quality, Online Analytical Processing, as well as the following areas of data mining: Motivation for data mining, Data Preprocessing, Data mining primitives and query languages, Architectures of data mining systems, Major Data Mining Tasks, Cluster Analysis , Statistical measures in large databases, Classifications and Predictions, Anomaly Detection.

Contents:

Data Warehouse: Planning and Requirements, Data Warehouse Architecture, Data Warehouse Infrastructure, Dimensional Modeling, Metadata, Extraction, Transformation and Loading, Online Analytical Processing, Data Preparation Techniques: outlier and missing data analysis, Data Reduction Techniques, Introduction to Data Mining, Modeling and Principal Feature Extraction, Clustering, Hierarchical Clustering, Partitional Clustering, Classification , Decision Tree Classification, Bayesian Classification, Nearest Neighbor Classification.

Text Books:

- The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Ralph Kimball, Margy Ross, Wiley, 2013
- Big Data Fundamentals: Concepts, Drivers & Techniques, Thomas Erl, Wajid Khattak, Paul Buhler, Prentice Hall, 2016

Reference Books:

- Data Warehousing Fundamentals for IT Professionals, Paulraj Pooniah, Wiley, 2nd Edition, 2010.
- Agile Data Warehouse Design: Collaborative Dimensional Modeling, from Whiteboard to Star Schema, Lawrence Corr, Jim Stagnitto, DecisionOne Press, 2011

Course Title: **Ontology Engineering**
Course Code: SEN-764
Pre-Requisite: None

Objectives:

This Course provides students with a theoretical and practical understanding of leading edge solutions for the Semantic Web. It introduces students to the W3C standard Web Ontology Language, OWL, its underlying Description Logics, establishing patterns to avoid the pitfalls in using OWL. The course provides an opportunity to become familiar with a widely used environment for developing and an API for applying OWL ontologies, and making use of reasoning services accessible via both. Ontology provide rich, repressive vocabularies of terms describing a domain (e.g. medicine, astronomy, music, etc.). They are key to information exchange, data integration and search.

Contents:

Introduction to Description Logics and Reasoning, concepts of semantic interoperability, integration and automation; concept of metadata and ontology; RDF and RDFS, Ontology Web Language (OWL) and Ontology Engineering Methodologies.

Text Books:

- Ontology Engineering in a Networked World, by Mari Carmen Suárez-Figueroa, Asunción Gómez-Pérez, Enrico Motta – 2012
- Building Ontologies with Basic Formal Ontology, Robert Arp, Barry Smith, Andrew D. Spear, MIT Press, 2015

Reference Books:

- Semantic Web for the Working Ontologist, D. Allemang and J. Hendler, Morgan Kaufmann Pub, 2008
- Ontology Management: Semantic Web, Semantic Web Services, and Business Applications, Martin Hepp, Pieter de Leenheer, Aldo de Moor, York Sure, Springer, 2008.

Appendage 3023

BSc(Hons) Allied Health Sciences Program for Medical & Dental Technician

Background of the Case:

BUMDC intends to start BSc(Hons) Allied Health Sciences Program for Medical & Dental Laboratory Technicians. V/P Dental Section and HoD MDRL BMDC will give presentation on the subject. PMDC also recommends to establish/start these programs within 10 years of start of medical/ dental college.

Financial Effects:

BUMDC to enhance finances in terms of fee.

Recommendations:

Recommended

Establishment / HR effect any:

Existing faculty will be sufficient to teach students.

PROPOSAL FOR LAUNCHING
Bachelor of Science in Allied Health Sciences
(Medical Technology)

A. ACADEMIC DETAILS	
1	Faculty/Department: Multidisciplinary Research Lab , Bahria University Medical and Dental College
2	Name of the Programme: Bachelor of Science in Medical Technology
3	Mission of the Programme: The mission of medical technology programme in Clinical Laboratory science is to prepare skillfull graduates with adequate scientific knowledge. This program is dedicated to deliver quality learning experience and development of expertise in technological practices required for professional clinical laboratory scientist.
4	Objectives of the Programme: <ul style="list-style-type: none"> • To prepare a team of health technologists who can effectively assist senior health professionals in the delivery of quality health services. • To prepare graduate Medical Technologist with the knowledge and abilities needed for certification by nationally recognized professional agencies. • To prepare paramedical workers for all levels of the health care delivery system from the primary to the tertiary level. • To introduce and impart standard technical education with advanced techniques by replacing the conventional methods of pre-service training (certificate level). • To provide paramedical workers a status and recognition in the health care delivery system through improving their capacity along with increasing awareness of their responsibilities, authority and job description. • To facilitate paramedical staff with modern skills and techniques and latest technical knowledge of international level.
5	Outcomes of the Programme: <ul style="list-style-type: none"> • Graduates will be prepared as proficient Medical Professionals that work with physicians and other members of the healthcare team, preparing specimens and analyzing blood and other body fluids to diagnose and detect disease • Graduates will be able to deliver the services in performing the full range of clinical laboratory tests in areas such as hematology, clinical chemistry, immunohematology, microbiology, serology/immunology, coagulation, molecular, and other emerging diagnostics. • Graduates will have diverse responsibilities in areas of analysis and clinical decision-making, regulatory compliance with applicable regulations, education, and quality assurance/performance improvement wherever laboratory testing is researched, developed or performed. • Graduates will possess basic knowledge, skills, and relevant experiences in: Communications to enable consultative interactions with members of the healthcare team, external relations, customer service and patient education; • Graduates will be able to deal efficiently with all departments including financial, operations, marketing, and human resource management of the clinical laboratory to enable cost-effective, high-quality, value-added laboratory service. • Graduates will also be enabled to do effective, timely, accurate, and cost-effective reporting of laboratory-generated information, • Research design/practice sufficient to evaluate published studies as an informed consumer.
6	Rationale for the Programme:

	<p>Medical technologists are the vital members of the health care team. Doctors make many of their decisions about diagnosis and treatment of disease based on laboratory test results and about 70 percent of treatment decisions are based on these results.</p> <ul style="list-style-type: none"> • By this the graduate Medical Technologist will be prepared with the knowledge and abilities needed for certification by nationally recognized professional agencies With the help of this undergraduate program, highly trained professionals will be developed who can utilize proven technology to provide life-saving medical information used to treat patients. • This program will provide excellent opportunity to technicians already working in clinical labs and hospitals to establish their career as medical technologist and can earn a decent salary. • This program will provide a career path to the students and lab workers with advanced research opportunities as scientists, which can boost their professional career and enhances the promotion chances up to senior and supervisor level. • This program will also enable the medical college to fully utilize its pre-existing resources like multidisciplinary research lab in undergraduate teaching as well. • This programme will develop conscientious, caring, skilled personalities that are highly capable of comprehending, practicing medical technology to meet meeting healthcare needs of the society. 																
7	<p>Brief Description of the Programme:</p> <p>Bahria University Medical and Dental College is offering Bachelor of Science (BS) in Medical Technology in the field of Clinical Laboratory Science/Clinical Pathology/Clinical Chemistry / Medical Biochemistry. This is four Year degree Program consisting of Core (compulsory) courses and specialized courses. The program of study is as follows.</p> <table border="1"> <tr> <td>Course title</td><td>BS (4 year degree program) in Medical Technology Offered in Clinical Laboratory Science/Clinical Pathology/Clinical Chemistry/ Medical Biochemistry</td></tr> <tr> <td>Course duration</td><td>4 YEARS</td></tr> <tr> <td>Study system</td><td>SEMESTER SYSTEM</td></tr> <tr> <td>No. of regular semesters</td><td>8</td></tr> <tr> <td>Semester Duration</td><td>16- 18 weeks</td></tr> <tr> <td>Total credit hours</td><td>130 (HEC recommended: 124-136)</td></tr> <tr> <td>Number of courses per semester</td><td>4-6</td></tr> <tr> <td>Course Load per Semester</td><td>15-18 credit hr</td></tr> </table>	Course title	BS (4 year degree program) in Medical Technology Offered in Clinical Laboratory Science/Clinical Pathology/Clinical Chemistry/ Medical Biochemistry	Course duration	4 YEARS	Study system	SEMESTER SYSTEM	No. of regular semesters	8	Semester Duration	16- 18 weeks	Total credit hours	130 (HEC recommended: 124-136)	Number of courses per semester	4-6	Course Load per Semester	15-18 credit hr
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Total credit hours	130 (HEC recommended: 124-136)																
Number of courses per semester	4-6																
Course Load per Semester	15-18 credit hr																
8	Duration: 4 years																
9	Venue(s): On Site ✓ /Off Site/Both On & Off Site (tick one/strike-through the ones not applicable; if Off Site, give details)																
10	<p>Programme Scheduling Format:</p> <ul style="list-style-type: none"> • Morning ✓ /Evening/Weekend (tick one/strike-through the ones not applicable) • Bi-Semester ✓ /Trimester/Semester+Summer Session/Annual/Bi-Annual (tick one/strike-through the ones not applicable) 																
11	Proposed Date of Commencement: 2018																
12	Mode of Study/Examination: Semester system																
13	<p>Additional Faculty Member(s) Required: (Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.)</p> <p>1) Full time dedicated faculty requirement includes one senior medical technologist as coordinator. 2) 1 Medical Technologist and 3 MSc available as non-teaching staff, needs to be converted into one department as faculty member (Lecturer).</p>																

14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) No additional skilled worker is required.
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) One class room or well-equipped lecture hall of 50 student capacity is required initially and number will be increased up to four for each batch every year till fourth year.
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) 1) For this program, Basic Research Lab exists in form of Multidisciplinary Research Lab but deficient in only one equipment i.e. automatic chemical analyzer. 2) Contract must be signed with PNS Shiffa for their clinical labs required for clinical rotation of students of BS in final year.
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: 1. Manual of Laboratory medicines AFIP, Third Edition 2005 Publication Armed Forces Institute of Pathology Rawalpindi Pakistan. 2. District laboratory practice in tropical countries Vol. 1 & 2 Monica Cheesbrough Cambridge University Press Low Price Edition 2000. 3. Clinical chemistry: principles, methods & interpretation 2nd Edition by Prof. Dr. Abdus Salam Khan Gandapur 2003. Tahir Instruments Ltd Singapura Road Lahore-Pakistan 4. Medical instrumentation By Kaplin, edition 5 th 5. Foundation of Clinical Research by Portney LG Walkais MP in 1993, Publisher by Appleton and lauge USA 6. Practical Hematology, Dacie J.V. 10th edition 7. John A. Koepre, Guide to clinical laboratory diagnosis 3th edition 2013 8. A handbook of "Laboratory Quality Management System" by World Health Organization, 2011, ISBN 978 92 4 154827 4 9. Henry's Clinical Diagnosis &Management by Laboratory method.
18	Minimum Entry Level: Intermediate
19	Admission Criteria: Candidates having 50% marks or above in intermediate science (preferably premedical) or equivalent examination are eligible to apply and all candidates seeking admission are required to appear in entrance test which will be conducted by Bahria University on particular time and date.
20	Additional/Different Examination Requirement (<i>Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue.</i>) Examinations will be done as per BU rules for BS.
21	Number of Admissions Expected for First Intake: 30
22	Number of Admissions Planned/Expected for Subsequent Intakes: 50
23	Referred by: FBOS: (<i>Indicate the FBOS meeting reference and Item No</i>) Approved in 12 th FBOS meeting on 21 st August, 2017. Competent Authority: (<i>Indicate the File No & date; reproduce the decision</i>)
24	Complete Plan of Studies, inclusive of complete Roadmap: (<i>Attach as Annex 'A'</i>) Road Map attached as Annexure A
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (<i>Attach as Annex 'B'</i>) Course outlines attached as Annexure B
B. FINANCIAL DETAILS	
1	Source of Funding: <ul style="list-style-type: none"> • BU: Fully✓/Partially: • Public Sector (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.)

	<ul style="list-style-type: none"> NNGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) INGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) UN/IGO (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) 																																																								
2	<p>Degree Duration: <u>Annual or Semester System:</u></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Annual</td> <td>Number of Years</td> <td>4</td> </tr> <tr> <td>Semester:</td> <td>Number of Semester</td> <td>8</td> </tr> </table> <p>Total Number of Credit Hours: 130</p>	Annual	Number of Years	4	Semester:	Number of Semester	8																																																		
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3 Expected fee to be charged based on Cost & Benefits Analysis: (show working) <i>Fee structure is proposed on the basis of comparative fee structure of other colleges</i>																																																									
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4	Expected Number of students for 1st & 2nd Intakes: Approximately 30																																																								
5	<p>Expected Earning from first two Intakes (B5): (Show working)</p> <p><i>Just one intake to be recommended as yearly practice is followed in various medical universities.</i></p> <p>A = Total fee of first intake: 85000 + 60000 = 145,000 B = No. of Students = 30 B5 = B X A = 4.35 million B5 = B x A = 4.35 million per intake</p>																																																								
6	<p>Expected Earning for the Next Five Years (B6): (show working)</p> <p><i>Working of Five years is given below, as BS is four year program</i></p> <p>A = Total fee of first intake: 85000 + 60000 = 145,000 B = fee of next year = 1,20,000 x 3 = 3,60,000 C = Total Earning/ student = A + B = 3,60,000 + 145,000 = 5,05,000/- D = (four years) = earning / expected no. of student = C X no. of students (30) = 15.5million/batch E = Five years include 05 batches intake</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Per Stud</th> <th style="text-align: center;">1st Year</th> <th style="text-align: center;">2nd Year</th> <th style="text-align: center;">3rd Year</th> <th style="text-align: center;">4th Year</th> <th style="text-align: center;">Earning/ Student</th> <th style="text-align: center;">No.Of Students</th> <th style="text-align: center;">Total (million)</th> </tr> </thead> <tbody> <tr> <td>Batch 1</td> <td>145,000</td> <td>1,20,000</td> <td>1,20,000</td> <td>1,20,000</td> <td>505,000</td> <td>30</td> <td>15.15</td> </tr> <tr> <td>Batch 2</td> <td>145,000</td> <td>1,20,000</td> <td>1,20,000</td> <td>1,20,000</td> <td>505,000</td> <td>30</td> <td>15.15</td> </tr> <tr> <td>Batch 3</td> <td>145,000</td> <td>1,20,000</td> <td>1,20,000</td> <td>X</td> <td>385,000</td> <td>30</td> <td>11.5</td> </tr> <tr> <td>Batch 4</td> <td>145,000</td> <td>1,20,000</td> <td>X</td> <td>X</td> <td>265,000</td> <td>30</td> <td>7.95</td> </tr> <tr> <td>Batch 5</td> <td>145,000</td> <td>X</td> <td>X</td> <td>X</td> <td>145,000</td> <td>30</td> <td>4.35</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>54.1</td> </tr> </tbody> </table> <p>B6 = 54.1 million</p>	Per Stud	1st Year	2nd Year	3rd Year	4th Year	Earning/ Student	No.Of Students	Total (million)	Batch 1	145,000	1,20,000	1,20,000	1,20,000	505,000	30	15.15	Batch 2	145,000	1,20,000	1,20,000	1,20,000	505,000	30	15.15	Batch 3	145,000	1,20,000	1,20,000	X	385,000	30	11.5	Batch 4	145,000	1,20,000	X	X	265,000	30	7.95	Batch 5	145,000	X	X	X	145,000	30	4.35								54.1
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7	<p>Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working)</p> <p>1) Salary of Coordinator/ Senior Medical Technologist/ Assistant Professor,A: Assistant Professor/ Senior Medical Technologist = 100,000 X 12 = 12 lac</p> <p>1) Salaries calculated after conversion of nonfaculty into faculty, B:</p> <table style="width: 100%;"> <tr> <td style="text-align: center;">4 Lecturers</td> <td style="text-align: center;">= 40,000 X 4 = 1.6 lacs</td> </tr> <tr> <td colspan="2" style="text-align: center;">A = 1.6 lac X 12 = 19.2 lac / year</td> </tr> </table>	4 Lecturers	= 40,000 X 4 = 1.6 lacs	A = 1.6 lac X 12 = 19.2 lac / year																																																					
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	<p>3) Honorarium of Shared faculty per year, C:</p> <table style="margin-left: 200px;"> <tr><td>Visiting faculty</td><td>= 2000/hr</td></tr> <tr><td></td><td>= 2000 X 16 weeks/semester</td></tr> <tr><td></td><td>= 32000 X 2 = 64,000/year/ subject</td></tr> <tr><td>6 subject taught</td><td>= 64,000 X 6 = 3.84 lac</td></tr> <tr><td></td><td>C = 3.84 lac</td></tr> </table> <p>B7 (Total salaries) = A+ B+ C</p> $B7 = 1.2 + 1.92 + 0.384 = 3.504$ <p>B7 = 3.504 million</p>	Visiting faculty	= 2000/hr		= 2000 X 16 weeks/semester		= 32000 X 2 = 64,000/year/ subject	6 subject taught	= 64,000 X 6 = 3.84 lac		C = 3.84 lac
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8	<p>Cost of Additional Laboratory Equipment/Tools (B8): (show working)</p> <p>Automatic Clinical Analyzer 1.1 million</p>										
9	<p>Cost of Additional Classrooms (B9): (Include furniture, technical aids etc)</p> <p>Furniture comprises of 50 chairs, multimedia, board, airconditioner comprises of approximately 1 million</p>										
10	<p>Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details) 0.5 million</p>										
11	<p>Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details) Nil</p>										
12	<p>Miscellaneous Expenses required for Starting the Program (B12):</p> <ul style="list-style-type: none"> - Advertisement: - Printing & Stationery - Admin Cost - Any other - Total 0.2 million 										
13	<p>Annual Recurring Expenditures in Subsequent Years (B13):</p> <ul style="list-style-type: none"> - Salaries: 3.504 million - Rentals: - - Subscriptions/Memberships: - - Advertisements: 0.2 million - Printing & Stationery: - Admin Cost - Any other - Total 3.524 million - Total 14.096 million / 4 years 										
14	<p>Total Cost of the Programme (B14): [Add B(7) to B(12)]</p> <p>B14 = 6.04 million/ 1st year</p> <p>For five years = 20.136 /5year = 4.02/ Year</p>										
15	<p>Net Cost of the Programme (B15): [Subtract B(6) from B(14)]</p> <p>20.136 – 54.1 = 33.96 million / 5 years</p> <p>B15 = 33.96 million/5 year</p>										
16	<p>Net Earnings in First Year (B16: [Subtract B(15) from B(5)]</p> <p>33.96 – 4.35 = 29.61 million</p> <p>B16 = 29.61 million</p>										
17	<p>Projected Annual Gross Earning in Subsequent Years (B 17): (show details & working; add 10% towards all expenses in subsequent years.)</p> <p>10 % of 3.524 million = (0.3524 million + 3.524 = 3.894) / 54.1 million – 3.894 million = 50.26 million</p> <p>B17 = 50.26 million</p>										
18	<p>Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)]</p> <p>14.096 (4 yr) + 6.04 (1st year) million – 50.26million = 14.26 million</p> <p>B18 = 30.124 million</p>										

GRAPHICAL SUMMARY OF FINANCIAL DETAILS

Figure A shows annual expected earning and expenditure:

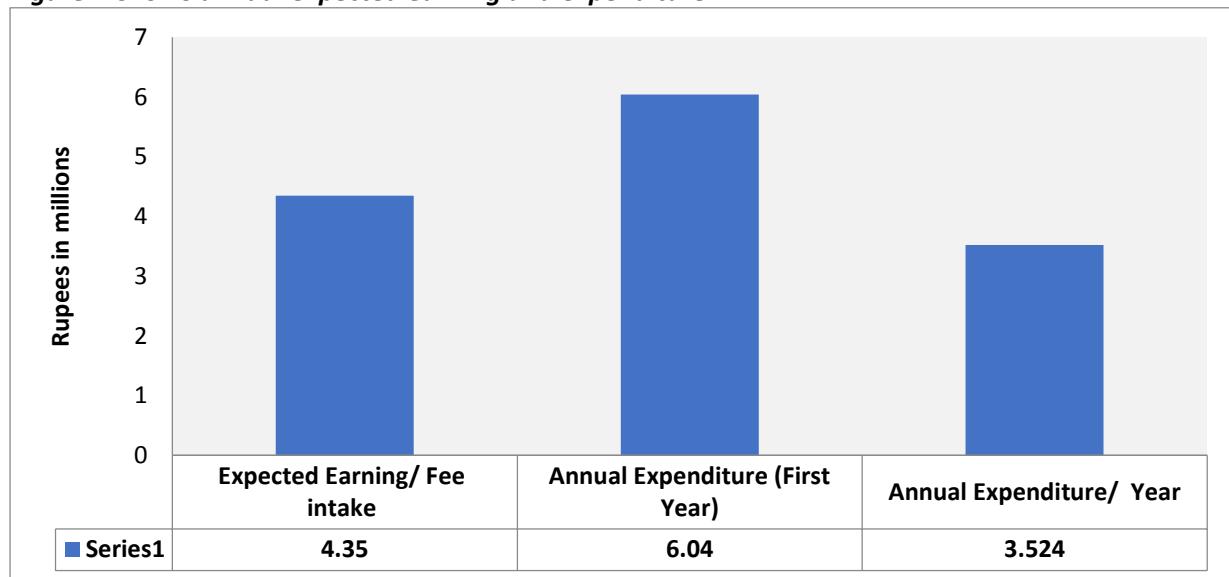
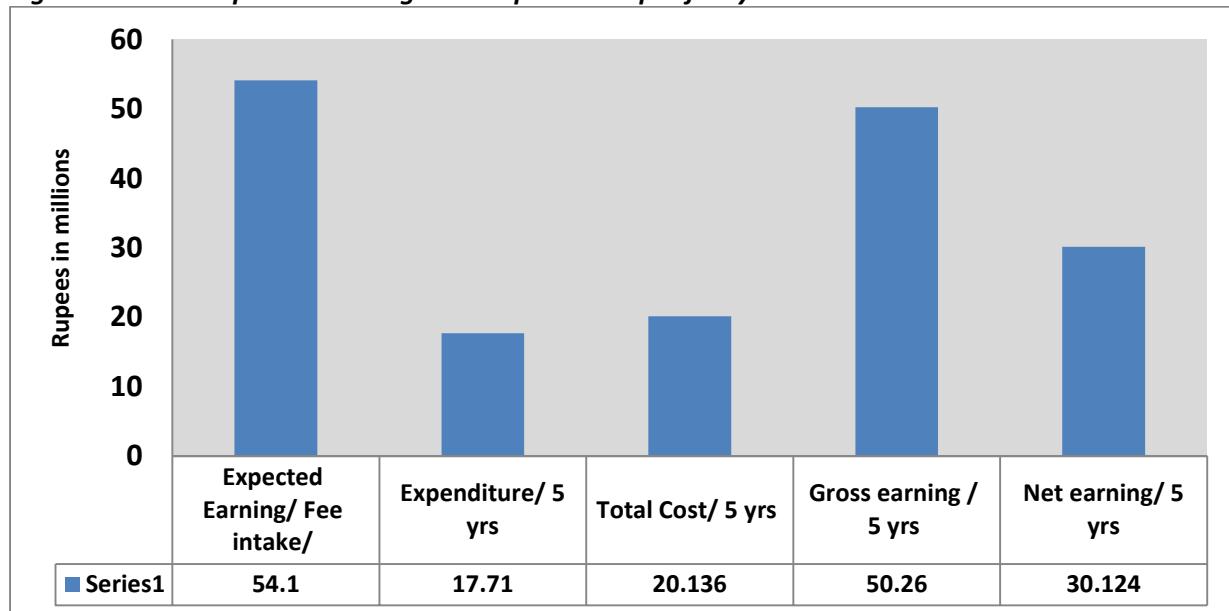


Figure B shows expected earnings and expenditure per five years :



Annexure 1

Complete Plan of Studies with Road Map

Working Paper for BSc (Honors) Program In Allied Health Sciences (Medical Laboratory Technologist)

Introduction:

A Medical Technologist (usually Medical laboratory scientist, Clinical Laboratory Scientist, Medical Laboratory Technologist) is an allied health professional that analyzes and tests body fluids and tissues. This includes blood, urine, CSF, synovial fluid, all types of tissue samples, and almost any type of sample removed from a patient for testing. Medical laboratory technologist can work in clinical laboratories at hospitals, doctor's clinics, reference labs and biotechnology labs. A Medical Laboratory

Technologist's role is to provide accurate laboratory results in a timely manner. An estimated 60 percent to 70 percent of all decisions regarding a patient's diagnosis and treatment, hospital admission and discharge are based on laboratory test results.

Medical Technology (MT) usually earns a bachelor's degree in clinical laboratory science, medical technology. In four-year medical laboratory degree programs, the student attends classroom courses for three years and clinical rotations are completed in their final year of study. In clinical rotations, the student experiences hands-on learning in each discipline of the laboratory and, under supervision, performs diagnostic testing in a functioning laboratory.

At present, there are many specialized field of Medical Technology including clinical biochemistry, hematology, coagulation, microbiology, bacteriology, toxicology, virology, parasitology, mycology, immunology, blood banking, histopathology, cytopathology, genetics, cytogenetic labs, radiology, critical care, operation theatre but with respect to our human resources, we can offer program currently in clinical laboratory science.

Objectives of the Program

- To prepare a team of health technologists who can effectively assist senior health professionals in the delivery of quality health services.
- To prepare paramedical workers for all levels of the health care delivery system from the primary to the tertiary level.
- To introduce and impart standard technical education with advanced techniques by replacing the conventional methods of pre-service training (certificate level).
- To provide paramedical workers a status and recognition in the health care delivery system through improving their capacity along with increasing awareness of their responsibilities, authority and job description.
- To facilitate paramedical staff with modern skills and techniques and latest technical knowledge of international level.

Admission Eligibility Criteria:

- Candidates having 50% marks or above in intermediate science (preferably premedical) or equivalent examination are eligible to apply.
- All candidates seeking admission are required to appear in entrance test which will be conducted by Bahria University on particular time and date.

Entrance Test:

Based on recent syllabus of the Board of Intermediate and Secondary Education Karachi, the test will be comprised of following subjects:

Subject	No. of Questions
Biology/Maths	25 Questions
Chemistry	25 Questions
Physics	25 Questions
English	25 Questions

Admission and Registration Procedure:

- Admission procedure comprises of submission of a completed prescribed application form with supported documents (including copies of matric mark sheet, provisional certificate, intermediate mark sheet and intermediate provisional certificate) as mentioned in the prescribed form
- Candidates, whose application submission requirements are complete, will sit for the scheduled Entrance test.

- Interview of short listed candidates by Admission Committee nominated by Principal/ Dean Health Sciences comprising Chairperson, and respective departmental heads will be conducted.
- On the recommendation of the Admission Committee, successful candidate/s will receive admission offer to the BS program.
- Candidate/s who accepts the offer will be required to register on or before the date given in the offer letter, the failure to do so shall result in the cancellation of his/her admission.

Program of study:

Course title	BS (4 year degree program) in Medical Technology Offered in Clinical Laboratory Science/Clinical Pathology/Clinical Chemistry/ Medical Biochemistry
Course duration	4 YEARS
Study system	SEMESTER SYSTEM
No. of regular semesters	8
Semester Duration	16- 18 weeks
Total credit hours	130 (HEC recommended: 124-136)
Number of courses per semester	4-6
Course Load per Semester	15-18 credit hr
Course Title with study hrs	See table 1& II

Table I: Distribution of Credit Hours Course Work

Semester	Total No. of Credit hrs
I	18
II	16
III	18
IV	18
V	17
VI	15
VII	16
VIII	12
TOTAL	130

Table II: Details with title of courses

Year	Semester	Title of Course	Credit hrs
1 st year	I	Biochemistry -I	3 + 1
		Human Physiology-I	3 + 1
		Human Anatomy-I	3 + 1
		English	2 + 0
		Pakistan Studies	2 + 0
		Computer Skills	1+ 1
	II	Biochemistry -II	3 + 1
		Human Physiology-II	3 + 1
		Human Anatomy -II	3 + 1
		English	2 + 0
		Islamic Studies	2 + 0
	III	General Pathology-II	2+ 1
		General Pharmacology-II	2+ 1
		Hematology	2+ 1
		Human Genetics	2+ 1

2nd year		Communication Skills	2+ 1
		Medical Microbiology	2+ 1
3rd year	IV	General Pathology	2+ 1
		General Pharmacology	2+ 1
		Clinical Virology and Mycology	2+ 1
		Medical Microbiology-II	2+ 1
		Hematology -II	2+ 1
		Chemical Pathology	2+ 1
3rd year	V	WBCS and Platelets Disorders	2+1
		Histopathology	2+1
		Bioinformatics	1+2
		Clinical Parasitology	2+1
		Clinical Pathology	2+1
		Biotechnology	1+1
4th year	VI	Medical Laboratory Instrumentation	2+1
		Biostatistics	2+1
		Immunology and serology	2+1
		Research Methodology	2+1
		Blood Banking	2+1
4th year	VII	Medical Laboratory Management Skills	2+1
		Fundamental of infection control	1+1
		Molecular Biology	2 +1
		Epidemiology	2 +0
		Systematic Diagnostic Bacteriology	2 +1
		Cytology and Cytogenetics	2 +1
	VIII	Research Project	6
		Seminar	1+0
		Medical Sociology	2 +1
		Bioethics	1+1

Examination:

Examinations will be done as per BU rules for BS.

Requirements:

-
- Qualified Faculty
 - Infra-structure including lecture halls equipped with multimedia
 - Well-equipped Laboratories
 - Clinical Lab
 - Library
 - Digital Library

Annexure II Course outlines

1st SEMESTER COURSES

1. MEDICAL BIOCHEMISTRY -I
2. HUMAN PHYSIOLOGY-I
3. HUMAN ANATOMY-I
4. ENGLISH-I
5. PAK STUDIES
6. COMPUTER SKILLS

MEDICAL BIOCHEMISTRY-I Credit Hours: 4(3+1)

Course objectives:

- To understand the chemical composition, biochemical role, digestion and absorption of macro and micro molecules of the cell.
- To understand different biochemical reactions in cell.
- To understand mechanism of action of hormones.

Course contents:

Biochemical composition and functions of the cell membrane; Chemistry of signals and receptors; Structure and function of Carbohydrates, Proteins and lipids; biochemical functions of vitamins; biochemical function of Sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfur, iodine and fluoride; Composition and function of saliva, gastric juice, gastric acid(HCl), pancreatic juice, bile and intestinal secretion; Digestion and absorption of proteins, carbohydrates, lipids, vitamins and minerals; Body buffers and their mechanism of action; Acid base regulation in human body; Biochemical mechanisms for control of water and electrolyte balance; Mechanism of action of hormones.

Practicals:

1. Good laboratory Practices
2. Preparation of Solutions
3. Principles of Biochemistry analyzers(spectrophotometer, flame photometer)
4. Determination of Cholesterol, TG, HDL, LDL, sugar, calcium and phosphorus in blood
5. SOP of centrifuge, water bath and microscope

Recommended Books

- Harper's Biochemistry Robert K. Murray, Daryl K. Granner 28th edition 2009
- Medical Biochemistry Mushtaq Ahmad vol. I and II 8th edition 2013

HUMAN PHYSIOLOGY-I Credit Hours: 4(3+1)

Course Objectives:

- To understand the basic concepts of physiology beginning from the cell organization to organ system function.
- To understand the organization of cell, tissue organ and system with respect to their functions.
- To Understand the physiology of Respiration, G.I.T, Urinary system and Endocrine system

Course Contents:

Functional organization of human body, Mechanism of Homeostasis, Cell structure and its function, function of different Tissue, Functions of the skin, , Types and function of muscle, Neuromuscular junction, functions of the endocrine glands, Breathing Mechanism, Exchange of respiratory Gaseous, Transport of respiratory gases, Function of different part of Digestive system, Function of liver and pancreas, Digestion and Absorption in Gastrointestinal tract, Patho-Physiology of Gastrointestinal Disorders, Formation of Urine by the Kidney, Glomerular filtration, Renal and associated mechanism

for controlling ECF, Regulation of Acid-Base Balance, Male Reproductive System (Male), Prostate gland, Spermatogenesis, Female Reproductive System, Menstrual Cycle and Pregnancy and parturition, Mammary Glands and Lactation and Fertility Control

Practicals:

1. Introduction to microscope
2. Bleeding time
3. Clotting time
4. WBCs count
5. RBCs count
6. Platelets count
7. Reticulocytes count

Recommended Books:

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Concise Physiology Dr. Raja Shahzad 1st Edition 2012
- Guyton And Hall Textbook Of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health And Illness 11th Edition Anne Waugh, Allison Grant 2010

HUMAN ANATOMY-I Credit Hours:4(3+1)

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organ system function
- To understand the basic concepts of general anatomy including skeleton and musculo skeleton.
- To Understand the anatomy of Thorax Abdomen and pelvis

Course contents:

Musculo skeletal system(Axial and Appendicular),Axial Skeleton, Different bones of human body, Axial and Appendicular Skeleton, Classification on the basis of development, region and function, General concept of ossification of bones, parts young bone, Blood supply of long bones. Joints Structural Regional and functional classification of joints,Characteristics of synovial joints, Classification of synovial joints, Movements of synovial joints. Muscular System Parts of muscle Classification of muscles (skeletal, Cardiac, smooth) Thoracic wall: Muscles of thorax, Surface Anatomy, Trachea, lungs, pleura, mammary glands (breast), Heart and thoracic vessels. Thoracic cavity: Mediastinum, Lungs, bronchi, blood supply and lymphatic Abdominal wall: Skin, nerve and blood supply, Muscles of anterior abdominal wall. Abdominal cavity: General Arrangement of the Abdominal Viscera, Peritoneum, Omenta, mesenteries, Stomach, blood, nerve, lymphatic supply, Small intestine, blood, nervous and lymphatic supply, Large intestine: blood nerve and lymphatic supply. The pelvic wall: Anterior, posterior wall, diaphragm. Pelvic cavity: Ureters, urinary bladder Male genital organs, Female genital organs, Muscles of pelvic region, blood supply, nerve supply, Special Senses.

Practicals:

1. Study Axial and Appendicular skeleton on human skeletal model.
2. Study musculoskeletal system on human musculoskeletal model.
3. Study organs of special senses.
4. Study and understand anatomy of Thorax, Abdomen and Pelvis through:
5. Human Models
6. Video demonstration.

Recommended Books:

- Ross and Wilson Anatomy and Physiology in helth and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard S. Snell.

Reference Books:

- Netter Atlas of human anatomy 5th Edition Saunders.

- Gray's Anatomy for students 2nd Edition Drake Vogal Mitcell.

ENGLISH –I Credit Hours: 2(2+0)

Course Objective:

- To enable the students to meet their real life communication needs
- To enhance language skills and develop critical thinking

Course Contents:

Vocabulary Building Skills: Antonyms, Synonyms, Homonyms, One word Substitute, Prefixes and suffixes, Idioms and phrasal verbs, Logical connectors, Check spellings, Practical Grammar & Writing Skill: Parts of Speech, Tenses, Paragraph writing: Practice in writing a good, unified and coherent paragraph, Précis writing and comprehension, Translation skills: Urdu to English, Reading skills: Skimming and scanning, intensive and extensive, and speed reading, summary and comprehension Paragraphs, Presentation skills: Developing, Oral Presentation skill, Personality development (emphasis on content, style and pronunciation)

Recommended books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.

Pakistan Studies (Compulsory) Credit Hours: 2(2+0)

Course Objectives:

- To develop vision of Historical Perspective, Government, Politics, Contemporary Pakistan, ideological background of Pakistan.
- To study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Contents:

Historical Perspective: Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah, Factors leading to Muslim separatism, People and Land, Indus Civilization, Muslim advent, Location and Geo-Physical features. Government and Politics in Pakistan, Political and constitutional phases: 1947-58, 1958-71, 1971-77, 1977-88, 1988-99, 1999 onward Contemporary Pakistan: Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan

Books Recommended:

- Akbar, S. Zaidi. Issue in Pakistan's Economy. Karachi: Oxford University Press, 2000.
- Mehmood, Safdar. Pakistan Kayyun Toota, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, nd.
- Amin, Tahir. Ethno - National Movement in Pakistan, Islamabad: Institute of Policy Studies, Islamabad.
- Afzal, M. Rafique. Political Parties in Pakistan, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.

COMPUTER SKILLS Credit Course: 2(1+1)

Course objectives:

- To understand the basic of computer
- To utilize the MS office, internet and email

Course Contents:

Introduction to Computer and Window XP/7; MS Office 2007 (Word, Excel, PowerPoint); Internet access and different data bases available on the internet; Email.

Recommended Books:

- Computer science by Muhammad Ashraf, edition 1st 2010

2nd SEMESTER COURSES

- MEDICAL BIOCHEMISTRY-II
- HUMAN PHYSIOLOGY-II
- HUMAN ANATOMY-II
- ENGLISH-II
- ISLAMIC STUDIES

MEDICAL BIOCHEMISTRY-II Credit Hours: 4(3+1)

Course Objectives:

- To understand the metabolism of carbohydrates, lipids and proteins.
- To understand clinical role of enzymes in human being.
- To understand about the nutrition.

Course Contents:

Balance food, Major food groups, Nutritional status of Pakistani nation, Metabolic changes in starvation, Protein energy malnutrition, Regulation of food intake, Obesity; metabolism of carbohydrates (Citric Acid Cycle, Glycolysis, Pentose Phosphate Pathway), proteins (urea and corie cycle), nucleotides (uric acid formation) and lipids (beta oxidation); Respiratory chain and oxidative phosphorylation, components of respiratory chain, electron carriers, ATP synthesis coupled with electron flow, phosphorylation of ADP coupled to electron transfer; clinical diagnostic enzymology: clinical significance of ALT, AST, ALP, LDH, CK, CKMB, Pancreatic lipase and amylase, cholinesterase, G6PD, GGT.

Practicals:

1. Determination of liver, cardiac, pancreatic enzymes
2. Determination of urea and uric acid

Recommended Books:

- Harper's Biochemistry Robert K. Murray, Daryl K. Granner 28th edition 2009
- Medical Biochemistry Mushtaq Ahmad vol. I and II 8th edition 2013

Human Physiology-II Credit Hours: 4(3+1)

Course Objectives:

- To understand the basic concepts of physiology beginning from the organization of the systems to their role in the body.
- Understand the organization and function of various systems
- Understand the physiology of Blood, CVS, Nervous System and special senses
- Students will be able to understand immunity, its types and immune reactions

Course Contents:

Physiology of Nervous System, Function of various cranial nerves, Functions of somatic motor nervous system Functions of the autonomic nervous system, function of neurons, neuroglial cells and their components. Resting membrane potential and an action potential, function of a synapse and reflex arc, functions of the specialized sense organs: Eye, physiology of site, accommodation, optic nerve and optic chiasma, Ear, functions of the internal, middle and external ear Physiology of the hearing and balance, Smell, physiology of olfactory nerve. Taste, physiology of taste Location of the taste buds Physiology of speech, Blood: Composition and function of Blood , haematopoisis, Blood grouping, Coagulation mechanism, Physiology of Cardiovascular system The Physiology of Pulmonary Systemic Circulation: Arteries Veins Local Control of Blood Vessels Nervous Control of Blood Vessels Regulation of Arterial Pressure, The function of Lymphatic System, tonsils, lymph nodes, the spleen and the thymus, Classification and physiology of Immune system, Antigens and Antibodies, Primary and secondary responses to an antigen Antibody-mediated immunity and cell-mediated immunity Role of lymphocyte in immunity regulation.

Practicals

1. Spirometry

2. Electrocardiography
3. Blood Pressure Measurement
4. Normal and abnormal ECG interpretation
5. Pulse rate measurement
6. Heart sounds

Recommended Books

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Guyton And Hall Textbook Of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health And Illness 11th Edition Anne Waugh, Allison Grant 2010

HUMAN ANATOMY-II Credit Hours: 4(3+1)

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organ system function
- To understand the anatomy of upper limb, lower limb and head and neck.
- To understand the knowledge about endocrine system

Course contents:

The upper limb Bones of shoulder girdle and Arm, Muscles, Axilla, Brachial plexus, Cubital fossa, the forearm, hand bones, muscles, Blood supply, Nerve supply, lymphatics, The lower limb Fascia, Bones, Muscles, Femoral triangle, Blood supply, Nerve supply, Lymphatic supply. Head and neck Skull, Mandible, Cranial nerves, cranial cavity, Meninges, Brain, Orbit, Neck, Endocrine System Classification of endocrine glands, Pituitary glands, Thyroid Glands, Adrenal gland and differences between the cortex and medulla.

Practicals:

Study and understand the anatomy of Upper limb, Lower limb, Head and Neck through:

- Human Models
- Video demonstration
- Study radiographs of upper and lower limb.

Recommended Books:

Essential books (text books)

- Ross and Wilson Anatomy and Physiology in health and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard S. Snell.

Reference books

- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake Vogal Mitcell.
- BD. Churasia Human Anatomy (All regions)

ENGLISH –II Credit Hours: 2(2+0)

Course Objectives:

- To enhance students writing, reading and listening skills.
- To enhance language skills and develop critical thinking.

Course contents:

Writing Skill: CV and job application, Technical Report writing, Writing styles, Changing narration: Converting a dialogue into a report, Converting a story into a news report, Converting a graph or picture into a short report or story, Active and Passive voice, Letter / memo writing and minutes of the meeting, use of library and internet resources, Essay writing, Phrases - Types and functions, Clauses - Types and functions, Punctuation: Tenses - Types, Structure, Function, Conversion into negative and interrogative. Speaking Skill: Group Discussion (Various topics given by the teacher), Presentation by the students (individually), Role Play Activities for improving Speaking. Listening Skill:

Listening Various Documentaries, Movies, and online listening activities to improve the listening as well as pronunciation of the words.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

ISLAMIC STUDIES Credit Hours: 2(2+0)

Course Objectives:

- To learn about Islam and its application in day to day life.
- To provide Basic information about Islamic Studies
- To enhance understanding of the students regarding Islamic Civilization
- To improve Students skill to perform prayers and other worships
- To enhance the skill of the students for understanding of issues related to faith and religious life.

Course contents:

Fundamental beliefs of Islam, Belief of Tawheed, Belief in Prophet hood, Belief in the Day of Judgment, Worships, Salaat / Prayer, Zakat /Obligatory Charity, Saum / Fasting, Hajj / Pilgrimage, Jihad, Importance of Paramedics In Islam, Ethics, Religion and Ethics, Higher Intents / Objectives of Islamic Sharia and Human Health, Importance and Virtues of Medical Profession, Contribution and Achievements of Muslim Doctors, Knowledge of the Rights, Wisdom and Prudence, Sympathy /Empathy, Responsible Life, Patience, Humbleness, Self Respect, Forgiveness, Kindhearted, Beneficence, Self Confidence, Observing Promise, Equality, Relation among the Doctors, Jealousy, Backbiting, Envy, Etiquettes of Gathering, Relation between a Doctor and a Patient, Gentle Speaking, Mercy and Affection, Consoling the Patient, To inquire the health of Patient, Character building of the Patient, Responsibilities of a Doctor,

Recommended Books:

- Islamiyat (Compulsory) for Khyber Medical University, Medical Colleges and Allied Institutes

3RD SEMESTER COURSES

1. GENERAL PATHOLOGY-I
2. GENERAL PHARMACOLOGY-I
3. CLINICAL BACTRIOLOGY
4. HEMATOLOGY-I
5. HUMAN GENETICS
6. COMMUNICATION SKILLS
7. MEDICAL MICROBIOLOGY-I (Non MLT students)

GENERAL PATHOLOGY-I Credit Hours: 3(2+1)

Course Objectives:

- To understand different pathological processes
- To the processes blood coagulation and embolism

- To understand the mechanism of wound healing and regeneration

Course Contents:

Introduction to pathology, Cell injury, Cellular adaptation, Acute Inflammation, Chronic Inflammation, Cell Repair & Wound Healing, Regeneration & Repair, Haemodynamic Disorders, Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia, Shock, compensatory mechanism of shock, possible consequences of thrombosis & difference between arterial & venous emboli, Neoplasia, Dysplasia, benign and malignant neoplasms, metastasis

Practicals:

1. Estimation of Prothrombin Time
2. Estimation of Clotting Time
3. Estimation of Bleeding Time
4. Estimation of Activated Partial Tromboplastin Time

Recommended Books:

- Robbins Basic Pathology Kumar Abbas Aster 9th Edition 2013
- Review Of General Pathology Moh. Firdaus 9th Edition
- Short Text Book of Pathology Moh. Inam Danish 3rd Edition 2006

GENERAL PHARMACOLOGY-I Credit Hours: 3(2+1)

Course Objectives:

- To discuss the roles and responsibilities of the various members of the health care team in maintaining patient safety during drug therapy
- To define common terms related to pharmacology and drug therapy.
- To discuss relevant historical, legal, and ethical issues related to pharmacology and drug therapy.

Course Contents:

Definitions of a drug pharmacology, clinical pharmacology, therapeutics, pharmacogenetics, therapeutic index, Pharmacokinetics: Drug passage across cell membrane, Plasma half-life, Steady state concentration, biological half life, Absorption: sites, enterohepatic circulation, bioavailability, factors affecting systemic availability, pre-systemic elimination, effect of food on drug kinetics, Distribution: protein binding, Metabolism: results of metabolism of drugs, sites of metabolism, phases of metabolism, enzyme induction, enzyme inhibition, Elimination: Excretion, Mechanism of drug action: Different mechanisms of drug action. Receptors: Drug binding to receptors, second messenger, receptor regulation. Dose-response relationship: agonist, antagonist, affinity, potency, efficacy, factors modifying drug response. Drug interactions: Definitions. Types of interaction: harmful and useful. Pharmacological basis of drug interaction: pharmacokinetic interactions; pharmacodynamics interactions; antagonism, synergism. An overview of Drugs acting on parasympathetic system, Antihypertensive drugs, An overview of Analgesics: Narcotics and Non-narcotics, An overview of Drugs acting in gastrointestinal tract, Drugs acting on respiratory tract, An overview of Drugs acting on endocrine system.

Practicals:

1. Routes of drug administration
2. Dose-Response Curves
3. Affect of adrenaline on pulse rate
4. Affect of beta blockers on heart rate after exercise
5. Source of drug and identification of some raw materials that are source of drug
6. Weight conversions and measurements
7. Preparation Sulfur ointment
8. Preparation of pilocarpine drops
9. Prescription writing

Recommended Books

- Lippincott's pharmacology (text book) by Mycek 2ndEdition published by Lippincott Raven 2000.

- Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 8th Edition, Published by Appleton & Lange 2007.
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CLINICAL BACTERIOLOGY Credit Hours :3(2+1)

Course Objectives:

- To introduce the students with basic concepts in clinical bacteriology.
- To introduce the students with epidemiology and pathology of bacterial infections.
- To introduce the students with basic and differential diagnosis of bacterial infections.
- To introduce the students with technical skills used in clinical bacteriology.

Course Contents:

Introduction to clinical bacteriology, sterilization, disinfection and antisepsis, structure and function of prokaryotic cell, difference between prokaryotic and eukaryotic cell, bacterial growth and metabolism, bacterial classification, normal microbial flora of human body, mechanism of bacterial pathogenesis, host parasite interaction, Immune response to infection, Gram positive and negative cocci, Gram positive and negative rods, Gram negative cocco-bacilli, Nocardia and Actinomyces, Mycobacteria, Spirochete, Mycoplasma, Rickettsia and Chlamydia, minor bacterial pathogen.

Practical:

- Introduction and demonstration of Laboratory Equipments used in clinical bacteriology.
- Demonstration of different types of physical and chemical methods of sterilization, and disinfection.
- Students should be thorough to work with compound microscope.
- Simple staining methods of pure culture and mixed culture.
- Gram's staining of pure culture and mixed culture.
- ZN staining of Normal smear, AFB positive smear.
- Isolation and identification of pure bacterial isolate.

Recommended Book:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M., & Trattler, B., 3rd ed. MedMaster, 2004.
- Bailey & Scott's Diagnostic Microbiology. Forbes, B., A., Sahm, D., A., Weissfeld, A., S., & Bailey, W., R., 12th ed. Elsevier Mosby, 2007.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

HEMATOLOGY-I Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students about the basic concepts in Hematology and acquire skill in practical work to produce students steeped in knowledge of Hematology.
- To equip students with latest advancements in the field of hematology.

Course Outlines:

Introduction to hematology, physiology of blood and composition, introduction to bone marrow, structure and function of bone marrow, blood formation in the body (Intra-uterine and extra-uterine), factors governing hematopoiesis, erythropoiesis, different stages and factor effecting on erythropoiesis, granulopoiesis, different stages and factor effecting on granulopoiesis,

megakariopoiesis, different stages and factor effecting on megakariopoiesis, introduction to hemoglobin structure, synthesis and function, complete blood count and its importance, morphology of red blood cells and white blood cells, introduction to anemia and classification of anemia, introduction to hemolysis (physiological and pathological), introduction to WBC disorders, introduction to leukemia, etiology, pathogenesis and its classification, leukocytosis, leukopenia, neutrophilia, condition related to neutrophilia, neutropenia, condition related to neutropenia, eosinophilia, condition related to eosinophilia, eosinopenia, condition related to eosinopenia, monocytosis, condition related to monocytosis, moncytopenia, condition related to moncytopenia, lymphocytosis, condition related to lymphocytosis, lymphopenia, condition related to lymphopenia, basophilia, condition related to basophilia, introduction to hemostasis, mechanism of hemostasis, function of platelets and coagulation factors, coagulation cascade, quantitative disorder of platelets, qualitative disorder of platelets.

Practical:

1. collection of blood sample
2. preparation and staining of peripheral blood smear
3. total leucocyte count, RBC count
4. determination of absolute values
5. differential leucocyte count; platelets count and reticulocytes count
6. to determine the ESR
7. determine bleeding time; prothrombin time; activated partial thromboplastin time

Recommended Books:

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degruchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

HUMAN GENETICS Credit Hours: 3(2+1)

Course Objectives:

- To introduce students with basic concept of human genetics
- To equip the students with instrumentation involved in human genetics

Course Contents:

Cell cycle, Introduction to Gene, Locus, Allele, Genotype, Phenotype, Homozygote, Dominant, Recessive, Mutations: Missense, Nonsense, Deletion, Insertion, Frame Shift/in-frame, Loss of function, Gain of Function, Pedigree Nomenclature, Modes of Inheritance-Dominant, Recessive, Autosomal, X-Linked, Mitochondrial, Recurrence Risk, Obligate carriers. X chromosome inactivation and formation of Bar Bodies, Variable expression, Population Genetics- Genotype Frequency, Allele Frequency, Restriction length polymorphism, Factors causing Genetic variation in Population, Genetic Drift, Cytogenetic analysis, Polymorphism Markers, Gene Map, linkage analysis, Genetic diagnosis and its applications.

Practicals:

1. Extraction of DNA and RNA
2. PCR amplification of genes
3. Use of Gel documentation
4. Preparation of pedigree

Recommended Books:

- Human genetics By Robertson, 2007, edition 4th.
- Human Genetics concepts and application By Ricki Lewis, edition 5th .

COMMUNICATION SKILLS Credit Hours: 3(2+1)

Course Objectives

By the end of the course students will be able to:

- Communicate effectively both verbally and non-verbally

- Apply the requisite academic communication skills in their essay writing and other forms of academic writing
- Use various computer-mediated communication platforms in their academic and professional work
- Relate to the interpersonal and organizational dynamics that affect effective communication in organizations.

Course contents:

Introduction to Communication , Meaning and definition of Communication, The process of communication, Models of communication, Effective Communications in Business, Importance and Benefits of effective communication, Components of Communication, Communication barriers, Non verbal communication, Principles of effective communication, Seven Cs, Communication for academic purposes, Introduction to academic writing, Summarizing, paraphrasing and argumentation skills, Textual cohesion, Communication in Organizations, Formal communication networks in organizations, Informal communication networks, Computer- mediated communication (videoconferencing, internet, e-mail, skype, groupware, etc), Business Writing , Memos, Letters, Reports, Proposals, Circulars, Public Speaking and Presentation skills, Effective public presentation skills, Audience analysis, Effective argumentation skills, Interview skills.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

MEDICAL MICROBIOLOGY-I (Non-MLT) Credit Hours: 3(2+1)

Course objectives:

- To introduce the students with basic concepts in bacteriology and mycology.
- To introduce the students with common bacterial and fungal infections.
- To introduce the students with diagnosis of common bacterial and fungal infections.

Course contents:

Historical review and scope of microbiology, sterilization, disinfection and antisepsis, structure and function of prokaryotic cell, difference between prokaryotic and eukaryotic cell, bacterial growth and metabolism, bacterial classification, normal microbial flora of human body, mechanism of bacterial pathogenesis, host parasite interaction, Immune response to infection, common bacterial pathogen prevailing in Pakistan, introduction to fungi, fungal characteristic, morphology, structure, replication and classification, mechanism of fungal pathogenesis, common fungal pathogen prevailing in Pakistan.

Practical:

1. Introduction and demonstration of Laboratory Equipments used in Microbiology.
2. Inoculation and isolation of pure bacterial culture and its antibiotic susceptibility testing.
3. Demonstration of different types of physical and chemical methods of sterilization, and disinfection.
4. Students should be thorough to work with compound microscope.
5. Detection of motility: Hanging drop examinations with motile bacteria, non-motile bacteria.
6. Simple staining methods of pure culture and mixed culture.
7. Gram's staining of pure culture and mixed culture.
8. AFB staining of Normal smear, AFB positive smear.

9. KOH preparation for fungal hyphae.
10. Germ tube test for yeast identification.
11. Gram stain for candida.

Recommended books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M., & Trattler, B., 3rd ed. MedMaster, 2004.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005.
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

4TH SEMESTER COURSES

1. GENERAL PHARMACOLOGY-II
2. GENERAL PATHOLOGY-II
3. RED BLOOD CELLS DISORDERS
4. CLINICAL VIROLOGY AND MYCOLOGY
5. CHEMICAL PATHOLOGY
6. BEHAVIORAL SCIENCES
7. Hematology II (Non MLT Students)
8. MEDICAL MICROBIOLOGY-II (Non MLT Students)

GENERAL PHARMACOLOGY-II Credit Hours: 3(2+1)

COURSE OBJECTIVES:

- To provide quality patient care in routine as well as advanced procedures.
- To understand the mechanism of drug action at molecular as well as cellular level, both desirable and adverse.
- To understand the principles of pharmacokinetics i.e. drug absorption, distribution, metabolism and excretion and be able to apply these principles in therapeutic practice.

Course contents:

Drugs acting on cardiovascular system; Drugs for heart failure, anti hypertensive drugs, anti arrhythmic drugs, antianginal drugs, Anti Hyperlipidemic drugs, Blood drugs, Diuretics, Insulin and glucose lowering drugs, Chemotherapeutic drugs, Antibiotics, Drugs acting on Respiratory system, Anesthetics.

Practical:

1. Routes of drug administration
2. Dose-Response Curves
3. Affect of adrenaline on pulse rate
4. Affect of beta blockers on heart rate after exercise
5. Source of drug and identification of some raw materials that are source of drug
6. Weight conversions and measurements
7. Preparation Sulfur ointment
8. Preparation of pilocarpine drops
9. Prescription writing

Recommended Books:

- Lippincott's pharmacology (text book) by Mycek 2nd Edition published by Lippincott Raven 2000.

- Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 8th Edition, Published by Appleton & Lange 2007.

GENERAL PATHOLOGY-II Credit Hours : 3(2+1)

Course Objectives:

- To introduce students with different environmental hazards
- To gain knowledge of some basic systemic diseases

Course contents:

Health effects of climate change, toxicity of chemical and physical agents, environmental pollution, effect of tobacco, effect of alcohol, injury by therapeutic drugs and drugs of abuse, general principles of microbial pathogenesis, special techniques for identifying infectious agents, agents of bioterrorism, heart failure, congenital heart diseases, ischemic heart diseases, hypertensive heart diseases, arrhythmias, atelectasis, chronic obstructive pulmonary disease, asthma, bronchiactasis, pneumonias, pneumothorax, hemothorax, nephrotic syndrome, renal stone, hydronephrosis, aphthous ulcer, gastritis, peptic ulcer, hemorrhoid, jaundice, liver cirrhosis, viral hepatitis, cholecystitis, urinary tract infections, arthritis, facial palsy

Practicals:

1. Helicobacter pylori test
2. Diagnosis methods of UTI
3. Determination of renal function tests
4. Determination of liver function tests
5. Determination of cardiac profile

Recommended Books:

- Robbins Basic Pathology Kumar Abbas Aster 9th Edition 2013
- Review Of General Pathology Moh.Firdaus, 9th Edition
- Short Text Book of Pathology Moh. Inam Danish 3rd Edition 2006

RED BLOOD CELLS DISORDERS credit hours: 3(2+1)

Course Objectives:

- To introduce the students about the basic concepts in Hematology and acquire skill in practical work to produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advancements in the field of hematology.

Course Outlines:

Introduction to erythropoiesis, bone marrow aspiration and trephine biopsy, procedure and importance, peripheral smear, preparation, drying & staining of peripheral smears, types of stains & methods of preparation, Criteria for good smear, introduction to anemia, classification, microcytic hypochromic anemia, iron metabolism, iron deficiency anemia, diagnosis and differential diagnosis of iron deficiency anemia, thalassemia, classification, pathophysiology and diagnosis and differential diagnosis of thalassemia, sideroblastic anemia, macrocytic anemia, folate and vitamin B12 metabolism, introduction to megaloblastic anemia, etiology, pathophysiology and diagnosis, enzymopathy, introduction to G6PD deficiency, pathophysiology, diagnosis and differential diagnosis, membranopathies, introduction to hereditary spherocytosis, etiology, pathophysiology diagnosis and differential diagnosis, introduction to sickle cell anemia, etiology, pathophysiology and diagnosis, hereditary elliptocytosis, pathophysiology and diagnosis, introduction to hemolytic anemia, immune hemolytic anemia, non Immune hemolytic anemia, introduction to aplastic anemia, etiology and diagnosis, introduction to disseminated intravascular coagulation, etiology and diagnosis.

Practical:

1. staining, preparation and procedure of staining
2. Automated cells counts
3. Hb Electrophoresis, procedure and importance

4. Ham's test, procedure and importance
5. Iron stain, procedure and importance
6. Osmotic Fragility test, procedure and importance
7. G6PD assay, procedure and importance.

Recommended Books:

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degrunchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

CLINICAL MYCOLOGY & VIRIOLOGY Credit Hours 3(2+1)

Course objectives:

- To introduce the students with basic concepts in clinical mycology and virology.
- To introduce the students with epidemiology and pathology of fungal and viral infections.
- To introduce the students with basic and differential diagnosis of fungal and viral infections.
- To introduce the students with technical skills used in clinical mycology and virology.

Course contents:

Introduction to clinical mycology, introduction to fungi, fungal characteristic, morphology, structure, replication and classification, mechanism of fungal pathogenesis, growth and isolation of fungi, laboratory approaches to diagnose fungal infection, clinical categorization of fungal infections, superficial mycoses, cutaneous mycosis, subcutaneous mycoses, systemic mycoses and opportunistic fungi, introduction to clinical virology, Viral morphology, structure, replication and classification, general properties of virus, pathogenesis and control of virus, DNA viruses (envelop and nonenvelop), RNA viruses (envelop and non envelop), Hepatitis viruses, Arboviruses, tumer viruses, slow viruses and Prions, minor viral pathogens.

Practical:

1. Study of growth characteristics, microscopic examination and identification of medically important fungi, collection, transportation and processing of specimens for mycological examination.
2. KOH preparation for the identification of fungal hyphae.
3. Germ tube test for yeast identification.
4. Demonstration of serological methods/ICT devices for the diagnosis of viral infection.
5. Preparation of medias and stains used in mycology.
6. Demonstration of PCR for the diagnosis of HBV, HCV and HIV.
7. Demonstration of PCR for the genotyping of HBV and HCV.

Recommended Books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M.,& Trattler, B., 3rd ed. MedMaster, 2004.
- Bailey & Scott's Diagnostic Microbiology. Forbes, B., A., Sahm, D., A., Weissfeld, A., S., & Bailey, W., R., 12th ed. Elsevier Mosby, 2007.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

CHEMICAL PATHOLOGY Credit Hours: 3(2+1)

Course Objectives:

- To introduce students with advance techniques in Chemical Pathology and acquire skill in practical work to produce a team of Medical technologists steeped in knowledge of Pathology.
- To equipped Medical Technologists with latest advances in the field of Pathology.

Course Contents:

Synthesis, function and clinical significance of urea, uric acid and creatinine, determination of Lipids in blood, Cortical hormone, sex hormone, thyroid hormones, Tumour markers: alpha feto protein, CEA, HCG, CA, PSA, CA 125, Phenylketonuria, Aminoaciduria, Glycogen storage disease, Proteinuria, Ketonuria. Nephrotic syndrome, Malabsorption syndrome, Hyperbilirubinaemia & Jaundice, Hypoalbuminaemia, Cushing disease, Myxedema, Hypo & Hyperpituitarism, Amenorrhea, Hirsutism, Rickets, Osteomalacia, Chronic renal failure, OGTT.

Practicals:

1. Analysis of kidney function test
2. Analysis of lipids profile test
3. Analysis of hormones and different tumors markers

Recommended Books:

- John A. Koepre, Guide to clinical laboratory diagnosis 3th edition 2013
- Todd Sanford, Clinical diagnosis Saunders Co. USA By laboratory Method 13th edition 2009
- Fundamental of clinical chemistry, Carl A. Burtis. Saunders Elsevier, 6th edition, 2008.

BEHAVIORAL SCIENCES Credit Hours :2(2+0)

Course Objectives

- Conducting diagnostic interviews
- Formulating and clarifying diagnostic findings and treatment recommendations
- Documenting evaluation and treatment procedures, involving duties such as recording results of diagnostic interviews, lab studies, and/or treatment plans in a timely way according to the medical records protocols of the rotation site

Course Contents:

Introduction to Behavioral Sciences and its importance in health: Bio-Psycho-Social Model of Health Care and the Systems Approach, Normality vs Abnormality, Importance of Behavioral sciences in health, Desirable Attitudes in Health Professionals Understanding Behavior: Sensation and sense organs, Perception, Attention and concentration, Memory, Thinking, Communication, Individual Differences: Personality, Intelligence, Emotions, Motivation, Learning, Stress and Stressors, Life Events, Stress, Management, Interviewing / Psychosocial History Taking, Allied Health Ethics-Hippocratic oath, Culture and Allied Health practice, Psychological reactions, Breaking Bad News, Pain, Sleep, Consciousness.

Recommended Books:

- Behavioral Sciences by M.H Rana 2007, edition 5th
- Sociology in a Changing World by William Kornblum 8th edition 2007
- Changing Behavior: Immediately Transform Your Relationships with Easy-to-Learn, Proven Communication Skills by Georgiana Donadio 2011, edition 5th

Hematology II (Non-MLT) Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students about the basic concepts in Hematology and acquire skill in practical work to produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advancements in the field of hematology.

Course Outlines:

Iron metabolism, introduction to iron deficiency anemia, different stages and diagnosis, introduction to thalassemia, classification, pathophysiology and its diagnosis, introduction to Sidroblastic anemia,

etiology and diagnosis, folate and vitamin B12 metabolism, introduction to megaloblastic anemia, etiology and diagnosis, introduction to G6PD deficiency anemia, pathophysiology and diagnosis, introduction to sickle cell anemia, pathophysiology and diagnosis, introduction to hereditary spherocytosis, pathophysiology and diagnosis, introduction to hemolytic anemia, Immune hemolytic anemia, non immune hemolytic anemia, aplastic anemia, etiology and diagnosis.

ABO and Rh D group system, Kell blood group system, Ked blood group system, Duffy blood group system, donor selection criteria, phlebotomy of donor, blood products, preparation, storage and its importance, hem vigilance in blood bank, cross match, types of cross match, procedure and its importance, blood grouping and its importance, Coomb's test, types and importance, introduction to hemolytic disease of newborn, types, pathophysiology, diagnosis and management, hemolytic transfusion reactions and management.

Practical:

1. ABO blood grouping (Forward and Reverse grouping)
2. Rh Blood grouping
3. Antibodies screening
4. Cross matching (Major and Minor)
5. Coombs tests (Direct and Indirect)
6. Separation of different blood components
7. Du Test

Recommended books

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degrunchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

MEDICAL MICROBIOLOGY-II (Non-MLT) Credit Hours: 3(2+1)

Course objectives:

- To introduce the students with basic concepts in virology and parasitology.
- To introduce the students with common viral and parasitic infections.
- To introduce the students with diagnosis of common viral and parasitic infections.

Course contents:

Biosafety levels, control of hospital infection, biomedical waste management, introduction to virology, Viral morphology, structure, replication and classification, general properties of virus, pathogenesis and control of virus, common viral pathogen prevailing in Pakistan, introduction to parasitology, Parasite (protozoan and helminthes) morphology and classification, general principle of pathogenesis, immunology and diagnosis of parasitic infection, common parasitic pathogen prevailing in Pakistan.

Practical:

1. Cleaning of new and used glass wares for microbiological purposes.
2. Students should be familiar to use autoclave, hot air oven, water bath, steamer etc.
3. Macroscopic and microscopic examination of stool for adult worms, ova, cysts, larvae.
4. Visit to hospital for demonstration of biomedical waste management.
5. Demonstration of common serological tests used for the diagnosis of viral and parasitic infection.
6. Demonstration of malarial parasites in blood and bone marrow.
7. Demonstration of leishmania in blood film.
8. Concentration techniques for intestinal parasites in stool.

Recommended books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M., & Trattler, B., 3rd ed. MedMaster, 2004.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.

- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005.
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

5TH SEMESTER COURSES

1. WBCs AND PLATELETS DISORDERS
2. HISTOPATHOLOGY
3. BIOINFORMATICS
4. CLINICAL PARASITOLOGY
5. CLINICAL PATHOLOGY
6. BIOTECHNOLOGY

WBC and Platelets Disorders Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students with the concepts in Hematology and acquire skill in practical work to produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advancement in the field of Pathology.

Course contents:

leucopoiesis, introduction to WBC,s disorders, investigations towards WBC,s disorders, introduction to leukemia, causes, classification and diagnosis, introduction to acute leukemia, classification, diagnosis, introduction to acute lymphoblastic leukemia, diagnosis, acute myeloid leukemia, classification and diagnosis, chromic leukemia, classification and diagnosis, chronic myeloid leukemia, pathogenesis, diagnosis and differential diagnosis of chronic myeloid leukemia, chronic lymphocytic leukemia, classification, diagnosis and differential diagnosis, myeloproliferative disorders, introduction to plasma cell discrasias, classification, multiple myeloma, lymphoma classification, introduction to hemostasis, primary hemostasis, secondary hemostasis, coagulation, coagulation factors, inhibitors of coagulation, fibrinolytic system, introduction to hemophilia, classification, diagnosis, thrombotic thrombocytopenic parpura, pathogenesis, and diagnosis, hemolytic uremic syndrome, pathogenesis, diagnosis, won vallibrand diseases, classification and diagnosis, glanzman thrombastenia, barnad solar syndrome, immune thrombocytopenic purpura Correction Studies.

Practical:

1. Morphology of leukemic slides
2. Automated differential count
3. Flowcytometry
4. Sudan Black B
5. Myeloperoxidase stain
6. Periodic acid shift
7. Esterase stain
8. Leukocytes alkaline phosphatase Score
9. Prothrombin Time
10. Partial Thromboplastin time
11. Fibrinogen Assay
12. FDP,s and D-Dimer
13. Clot solubility test for factor Xiii
14. Hess,s test

Recommended Books:

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degrunchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

HISTOPATHOLOGY Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students with the basic concepts in Histopathology and acquire skill in practical work.
- To produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advances in techniques in the field of Pathology.

Course Contents:

Reception and Fixation of Biopsy, Fixatives: Purpose, types and preparation of fixatives, Qualities of good fixative, factors affecting fixation, Gross examination, Processing of tissues: manual and automation, Steps in processing: dehydration, clearing and impregnation, Embedding and cutting of sections, Microtome & tissue sectioning techniques, Floating water bath, Decalcification of bone, Knife sharpener, H and E staining, frozen sections: Procedure and importance, cryostat, PAS: stain, Congo red stain, oil red stain, Zeihl neelsen, giemsa and reticulocytes stain.

Practicals:

1. Collection of different biopsy and cytology specimens
2. Performing fixation, clearing, embedding, cutting and staining of histopathology specimens

Recommended Books:

- Manual of Laboratory Medicines AFIP, 3rd Edition 2005 Publication Armed Forces Institute of Pathology, Rawalpindi, Pakistan
- Wheater's Functional Histology by Paul R. Wheater 3rd Edition 1995 ELBS with Churchill Livingstone UK 6th edition 2013

BIOINFORMATICS Credit Hours 3(1+2)

Course Objective:

- To train students to analyze genetics data for research.

Course Contents:

Introduction to information technology and Bioinformatics Basic concepts, genome database and human genome project, Biological databases, protein identification, Data retrieval and analysis using computer programs NCBI, GenBank, Swiss prot, Expassy Finding Genes in DNA, complimentary sequence generation, Structure of proteins, codon redundancy, Concept of coding sequence, non-coding sequences, Codons, Start codon, stop codon, Application of Bioinformatics: DNA microarrays, Deducing protein primary sequence from DNA or RNA sequences.

Practicals:

1. Use of Bioinformatics software for data analysis

Recommended Books:

- Introduction to Bioinformatics By Arthur M. Lesk, 3rd edition 2002.
- Bioinformatics: Sequence and genome analysis By David W. Mount, 2nd Edition 2004.

CLINICAL PARASITOLOGY Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students with basic concepts in clinical parasitology.
- To introduce the students with epidemiology and pathology of parasitic infections.
- To introduce the students with basic and differential diagnosis of parasitic infections.
- To introduce the students with technical skills used in clinical parasitology.

Course Contents:

Introduction to clinical parasitology, Parasite (protozoan and metazoan) morphology and classification, general principal of pathogenesis, immunology and diagnosis of parasitic infection, Protozoan: Sporozoa (Plasmodium, Toxoplasma, Cryptosporidium, Isospora), Rhizopods (Entamoebahistolytica, Naegleria, Acanthamoeba, Balantidium coli), Flagellates (Gardialamblia, Trichomonas vaginalis, Leishmania, Trypanosoma), Metazoan: Intestinal nematodes

(Enterobiusvermicularis, Trichuristrichiura, Ascarislumbricoides, Nectar americanus, Ancylostomaduodenale, Strongyloidesstercoralis), Tissue nematode (Wuchereriabancrofti, Brugiamalayi, Onchocerca volvulus, Loa loa, Dracunculusmedinensis), Cestode (Teniasaginata & solium, Diphyllobothriumlatum, Hymenolepis nana, Echinococcus) and Trematode (Paragonimus, Clonorchis, Schistosoma, Fasciola species).

Practical:

1. Identification of parasites of Medical importance dealt in the theory.
2. Macroscopic and microscopic examination of stool for adult worms, ova, cysts, larvae.
3. Concentration techniques for intestinal parasites in stool.
4. Collection of blood and preparation of thick & thin smears.
5. Staining of blood smears for blood parasites.
6. Examination of blood smears for malaria & microfilaria and their identification.
7. Microscopic examination of urine for trichomonas vaginalis and shistosoma egg.

Recommended Books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M.,& Trattler, B., 3rd ed. MedMaster, 2004.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

CLINICAL PATHOLOGY Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students with basic concepts in clinical pathology and acquire skill in practical work to produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advancement in the field of Pathology

Course Contents:

Urine: Physical, chemical and microscopic composition of urine. Faeces: Physical, chemical and microscopic composition of faeces, Cerebrospinal fluid: Physical, chemical and microscopic composition of CSF. Aspiration fluids: Physical, chemical and microscopic composition of ascetic, pleural, pericardial and synovial fluids. Semen analysis: Physical, chemical and microscopic composition of seminal fluid, Urinary Calculi.

Practicals:

1. Physical, chemical and microscopic examination of urine
2. Physical, chemical and microscopic examination of faeces
3. Physical, chemical and microscopic examination of CSF
4. Physical, chemical and microscopic examination of ascetic, pleural, pericardial and synovial fluids
5. Physical, chemical and microscopic composition of seminal fluid
6. Physical and chemical composition of urinary Calculi

Recommended Books

- Manual of Laboratory medicines AFIP, Third Edition 2005 Publication Armed Forces Institute of Pathology Rawalpindi Pakistan.
- District laboratory practice in tropical countries Vol. 1 & 2 Monica Cheesbrough Cambridge University Press Low Price Edition 2000.
- Clinical chemistry: principles, methods & interpretation 2nd Edition by Prof. Dr. Abdus Salam Khan Gandapur 2003. Tahir Instruments Ltd Singapura Road Lahore-Pakistan.

BIOTECHNOLOGY Credit Hours: 3(2+1)

Course Objectives:

- Basic techniques used in recombinant DNA technology.
- Practical use of genetic engineering.
- Understanding to the potential problems related to genetic engineering.

Course Contents:

Introduction and scope, Green revolution, Restriction and modification system, Properties of restriction endonucleases, their occurrence and recognition sequences, Practical uses of endonucleases, DNA sequencing, PCR: its application and primer designing, Labeling methods of probes, Construction of genomic libraries, important enzymes production, vaccine production, Genetic engineering for better animal production, cloning, herbicide resistant crops, petroplants, Bioremediation.

Practicals:

1. Methods of nucleic acid isolation (DNA & RNA)
2. Gel electrophoresis
3. Restriction Fragments Length Polymorphism
4. Southern, Northern and Western blotting Techniques.
5. Polymerase Chain Reaction

Recommended Books:

- James, D. W. 2013 Molecular Biology of Gene. Benjamin Cumming 7th edition 2013.
- Snustad, D.P and Simmons . M.J., 2012. Genetics, 6th Edition. John Wiley and Sons

6TH SEMESTER COURSES

1. MEDICAL LABORATORY INSTRUMENTATION
2. BIOSTATISTICS
3. IMMUNOLOGY AND SEROLOGY
4. RESEARCH METHODOLOGY
5. BLOOD BANKING
6. ADVANCES IN MEDICAL LABORATORY TECHNOLOGY

MEDICAL LABORATORY INSTRUMENTATION Credit Hours: 3(2+1)

Course Objectives:

- To train the students on all instruments used in pathology laboratory.

Course Contents:

Principle, procedure, calibration and maintenance of microscope, colorimeter, photometer, flame photometer, water bath, centrifuge, balance, incubator, pH meter, vertex mixer, oven, water still, deionizer, safety cabinet, electrophoresis assembly, thermo-cycler, chromatography, spectroscopy, flowcytometry, hematology analyzer, blood bank instruments and radiometric system.

Practicals:

Practical demonstration of

1. Microscope
2. Colorimeter
3. Photometer
4. Flame photometer
5. Water bath
6. Centrifuge
7. Balance
8. Incubator
9. pH meter
10. Vertex mixer
11. Oven
12. Water still

13. Deionizer

14. Safety cabinet, electrophoresis assembly, thermo-cycler, chromatography, spectroscopy and hematology analyzer

Recommended Books:

- Medical instrumentation By Kaplin, edition 5th .

BIOSTATISTICS Credit Hours: 3(2+1)

Course Objectives:

To introduce the student with the significance of bio-statistics, statistics means basic concept, describing and exploring data, normal distribution, sapling distribution and hypothesis testing, basic concept of probability and application of statistics and social research.

Course Contents:

Topics in univariate statistics: basic, Introduction, important terms, senses, method uses for taking sensus, information collection during sensus, method of estimating the population of any year, measurement scale, describing and exploring data, measures of central tendency and variability, health statistics, percentiles, quartiles and deciles, normal distribution, the standard normal distribution SND, using tables of SND, measures related to 'Z' scores, sampling distribution and hypothesis testing, basic concepts of probability, data collection (purpose and technique), categorical data and numerical data, application of statistics in social research, percentages, measure of central tendencies, means, Median, Mode, Quartile, decile and percentile

Recommended Books:

- Statistical methods for psychology by Howell DC in 7th edition 2013.
- A guide to research methodology, biostatistics and medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Reading understanding multivariate statistics by Gumm LG Yard AD PR, in 1995 publisher American Psychological association
- Ilyas Ansari's community medicine (Text Book) by Ilyas and Ansari 2003 published by Medical division Urdu Bazaar Karachi.

IMMUNOLOGY AND SEROLOGY Credit Hours :3(2+1)

Objectives:

- To introduce the students with basic concepts in immunology and serology.
- To introduce the students with diagnostic techniques in immunology and serology.
- To introduce the students with immuno and serodiagnosis of infectious diseases.
- To introduce the students with technical skills used in immunology and serology.

Course contents:

Introduction to immunity, cellular basis of the immune response, antibodies, humoral immunity, cell-mediated immunity, major histocompatibility complex & transplantation, complement, antigen-antibody reactions in the laboratory, hypersensitivity (Allergy), tolerance & autoimmune disease, tumor immunity, immunodeficiency, introduction to serology, introduction to serology, reactions in serology, serology of bacterial, viral, fungal and parasitic infections.

Practical:

1. Demonstration of ELISA.
2. Demonstration of Different antibody titer e.g. ASO titer.
3. Demonstration of chemiluminescent immunoassays for the detection of HBV and HCV.
4. VDRL Test, RPR, TPHA.
5. Brucella agglutination test.
6. Haemagglutination and Haemagglutination inhibition test.
7. RIA.

Recommended Books:

- Clinical Immunology and Serology. Stevens, C., D., 3rd ed. F.A. Davis Company, 2009

- Color Atlas of Immunology. Burmester, G., R., & Pezzutto, A., Thieme, 2003. *Medical Immunology*. Virella, G., 6th ed. CRC press, 2007.
- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.
- Bailey & Scott's Diagnostic Microbiology. Forbes, B., A., Sahm, D., A., Weissfeld, A., S., & Bailey, W., R., 12th ed. Elsevier Mosby, 2007.
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

RESEARCH METHODOLOGY Credit Hours: 3(2+1)

Course Objectives:

- To introduce the significance of research methodology foundation, concept of measurement, design clinical research and health system research to the students.

Course contents:

Introduction to research (in simple term and a scientific term), concept of research, why do need research, advantage of research, identification of research need and its qualities, component of research, ethical and legal aspect of research and objective of research (definition, purpose, structure) Relevance, Avoidance of duplication, Physibility, Political acceptability, Applicability, Cost efficiencies, work plan, budget required for research work, literature searching, statistical help, material, type of manuscript, printing of manuscript for submission and postage, Principles and reliability of measurement, errors and sources of measurement, types of measurement, measure of disease frequency and screening (introduction, validity and screening test) Studies design (introduction, selection of design), research questionnaire, validity and reliability of research finding, confounding factors, strategies to deal with threats to validity, hypothesis testing, sampling, collect data, data collection procedure, step and data collection survey questionnaire, starting questionnaire

Recommended Books:

- Foundation of Clinical Research by Portney LG Walkais MP in 1993, Publisher by Appleton and Lauge USA
- A guide to Research Methodology, Biostatistics and Medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Health system research project by Corlien M Varkerisser, Indra Pathmanathan, Ann Brownlee in 1993 by International Development Research Center in New Dehli, Singapore.

BLOOD BANKING Credit Hours :3(2+1)

Course Objectives:

- To introduce to the students basic concepts in Blood banking and transfusion medicine & acquire skill in practical work.
- To produce a team of Medical Technologists steeped in knowledge of Blood banking and transfusion medicine.
- To equip Medical Technologist with latest advance techniques in the field of transfusion medicines. To establish safe blood transfusion practice.

Course Contents:

Introduction to blood bank, immunoglobulin, structure, different type of immunoglobulin, antigen antibodies reactions, requirements of a standard blood bank, preparation of basic reagents, different anticoagulant use in blood bank, ABO and Rh D group system, kell blood group system, duffy blood group system, MNS blood group system, ked blood group system, other blood group system, donor selection criteria, phlebotomy of donor, processing of donor blood, blood products, preparation,

storage and its importance, hemovigilance in blood banking, cross match, types of cross match, procedure and importance of cross match, anti-human globulin test, types, procedure and importance and quality control of AHG, check cells, preparation and importance of check cells, transfusion reactions, investigation and management of transfusion reaction, hemolytic disease of newborn, classification, pathophysiology, diagnosis and management of HDN, quality control, external quality control, internal quality control in blood bank.

Practicals:

1. ABO blood grouping (Forward and Reverse grouping)
2. Rh Blood grouping
3. Antibodies screening
4. Cross matching (Major and Minor)
5. Coombs tests (Direct and Indirect)
6. Separation of different blood components

Recommended Books:

- Practical Hematology, Dacie J.V. 10th edition
- Introduction to Immunohematology: Bryant Neville J, third edition, 1994

ADVANCES IN MEDICAL LABORATORY Credit Hours: 3(2+1)

Course Objective:

- To aware the students on all advance technologies used in pathology laboratory.

Course Contents:

FISH (Fluorescence in-situ hybridization) technique, Radio immuno-assay, ELISA, Western, southern and northern blotting techniques, Types of PCR techniques, DNA sequencing, aphaeresis techniques in blood banking, HPLC, atomic absorption spectrophotometry

Practicals:

Practicals demonstration of:

1. RIA
2. ELISA
3. PCR
4. aphaeresis techniques
5. HPLC techniques

Recommended Books:

- Practical Hematology, Dacie J.V. 10th edition
- James, D. W. 2013 Molecular Biology of Gene. Benjamin Cumming 7th edition 2013.
- John A. Koepre, Guide to clinical laboratory diagnosis 3th edition 2013
- Todd Sanford, Clinical diagnosis Saunders Co. USA By laboratory Method 13th edition 2009
- Fundamental of clinical chemistry, Carl A. Burtis. Saunders Elsevier, 6th edition, 2008.

7TH SEMESTER COURSES

1. MEDICAL LABORATORY MANAGEMENT SKILLS
2. FUNDAMENTAL OF INFECTION CONTROL
3. MOLECULAR BIOLOGY
4. EPIDIOLOGY
5. SYSTEMIC DIAGNOSTIC BACTREIOLOGY
6. CYTOLOGY AND CYTOGENETICS

MEDICAL LABORATORY MANAGEMENT SKILLS Credit Hours 3(2+1)

Course Objectives:

- To introduced the students with management of different laboratories sections, equipments, records and duties.

Course Contents:

Introduction to quality, The quality management system model, Laboratory design, Safety management programme, Personal protective equipment, Equipment Selecting and acquiring equipment, Implementing an equipment maintenance programme, Equipment maintenance documentation, Purchasing and inventory, Implementing an inventory management programme, Forms and logs, Receipt and storage of supplies, sample management, The laboratory handbook, Collection and preservation, Sample storage, retention and disposal, Sample transport, Control materials, Establishing the value range for the control material, Graphically representing control ranges, Interpreting quality control data, Using quality control information, audits, External audit, Internal audit, external quality assessment, International standards and standardization bodies, Certification and accreditation, Personnel, Recruitment and orientation, Competency and competency assessment, Training and continuing education, Employee performance appraisal, Personnel records, Customer service, Customer satisfaction surveys, Occurrence management, Quality indicators, Documents and records, Standard operating procedures (SOPs), Computerized laboratory information systems, Organizational requirements for a quality management system

Recommended Books

- A handbook of "Laboratory Quality Management System" by World Health Organization, 2011, ISBN 978 92 4 154827 4

FUNDAMENTAL OF INFECTION CONTROL Credit Hours 2(1+1)

Course objectives:

- To introduce the students with basic concepts in infection control.
- To introduce the students with infection control principles and practices.
- To introduce the students with importance of immunization and hand hygiene in infection control.
- To introduce the students with the role of clinical laboratory in infection control.

Course contents:

Introduction to infection control, principle of infection control, source and transmission of infection, infection in the hospital environment, immunization prophylaxes, exposure prophylaxes, sterilization, disinfection and antisepsis, practical disinfection, epidemiology of infectious disease, antimicrobial agents, antibiotic and their uses (prophylactic, empirical , and therapeutic), antibiotic resistance and policy, principles of laboratory diagnosis of infectious diseases, biomedical waste management, biosafety levels, hand hygiene, standard precautions and PPE.

Practical:

1. Demonstration of hand washing and hand rubbing technique.
2. Preparation of different disinfection and antiseptic solutions.
3. Demonstration of biomedical waste managements in hospitals.
4. Demonstration of cleaning and disinfection of working premises.
5. Demonstration of how to handle spills and aseptic handling.
6. Demonstration of standard precautions and PPE.

Recommended Books:

- Fundamentals of Infection Prevention and Control: Theory and Practice. Weston, D., Wiley-Blackwell, 2013.
- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.

MOLECULAR BIOLOGY Credit Hours: 3(2+1)

Course Objectives:

- Basic techniques used in recombinant DNA technology.
- Practical use of genetic engineering.
- Understanding to the potential problems related to genetic engineering.

Course Contents:

Central dogma of Molecular Biology, DNA as genetic Material Double Helical Structure of DNA, Nucleotides, Nucleosides, Nitrogenous bases, DNA replication; Origin of replication, replication Mechanism, enzymes involved in replication, differences in replication of Prokaryotic and Eukaryotic genomes, Concept of Gene; Genes, Allels, One gene on Enzyme theory, Introduction to RNA; mRNA, rRNA, tRNA, siRNA, Transcription; Transcription in Prokaryotes, Transcription in Eukaryotes, Translation; Translation in Prokaryotes, Translation in Eukaryotes, DNA repair.

Practicals:

1. Instrumentation of PCR
2. Instrumentation of Gel Electrophoresis
3. Instrumentation of Western Blotting, Northern Blotting, Southern Blotting

Recommended Books:

Cell and molecular Biology By Gerald Karp, 5th edition 2005.

Molecular Biology By Robert F. Weavet 3rd edition 2010

EPIDEMIOLOGY Credit Hours: 2(1+1)

Course Objectives:

To introduce to the students the know-how of the subject of epidemiology in order to apply the knowledge of the subject regarding the community and community relate disease.

Course Contents:

Introduction to epidemiology, Determinants: Primary and Secondary, Clinical epidemiology, Occupational epidemiology, Importance of epidemiology, Definitions of common terms related to epidemiology, Health indication

Recommended Books:

- Public Health by Ilyas Ansari
- Public Health by J Park

SYSTEMIC DIAGNOSTIC BACTERIOLOGY Credit Hours 3(2+1)

Objectives:

- To introduce the students with basic concepts in diagnostic bacteriology.
- To introduce the students with laboratory procedure used in diagnostic bacteriology.
- To introduce the students with basic and differential diagnosis of bacterial infections.
- To introduce the students with technical skills used in diagnostic bacteriology.

Course content:

Introduction to diagnostic bacteriology, Collection, preservation, transport and processing of clinical specimens for the diagnosis of bacterial infections, detailed study of different methods of antibiotic susceptibility tests, media used, selection of drugs, quality control, beta lactamase detection, MRSA detection, antibiotic assay in blood and body fluids, detailed study of the principle, preparation of media and reagents, methods, interpretation and quality control of the biochemical test used for the Identification of bacteria, detail study of principles and method of preparation, pH adjustments, sterilization, storage of different types of media, transport media, anaerobic media, quality control in media preparation, cultivation of bacteria, Inoculation methods, incubation methods, Inoculation on different types of culture media in Petri dish, slopes, butt, broths, morphological study of bacterial colonies on plated media, anaerobic culture methods with recent advance.

Practical:

1. Different methods & interpretation of antibiotic sensitivity testing and minimal inhibitory concentration.
2. MTB culture by concentration method.
3. Biochemical tests used for the identification of bacteria.
4. Preparation of commonly used laboratory medias, sterilization, Quality control and storage.
5. Collection, transportation and processing of all type of clinical specimens for the diagnosis of bacterial infections discussed in theory.
6. Inoculation and isolation of pure and mixed bacterial culture.
7. Identification of medically important bacteria from pure culture.
8. Special stains used in bacteriology.

Recommended Books:

- Bailey & Scott's Diagnostic Microbiology. Forbes, B., A., Sahm, D., A., Weissfeld, A., S., & Bailey, W., R., 12th ed. Elsevier Mosby, 2007.
- A Photographic Atlas for the Microbiology Laboratory. Leboffe, M., J., & Pierce, B., E., 4th ed. Douglas N. Morton, 2010.
- Principles and Practice of Clinical Bacteriology. Gillespie, S., H., & Hawkey, P., M., 2nd ed. Wiley-Blackwell, 2005.
- District Laboratory Practice in Tropical Countries, Part 1 & Part 2. Cheesbrough, M., 2nd ed. Cambridge University Press, 2006.

CYTOSIS AND CYTOGENETICS Credit Hours 3(2+1)

Course Objectives:

- To introduce the students with basic concept of cytology and cytogenetics
- To equip the student with techniques involved in cytology and cytogenetics

Course content:

Cytology

Morphology and physiology of cell, cytology of: female genital tract, urinary tract, gastrointestinal tract, respiratory tract, effusions, miscellaneous fluids, collection, preservation, fixation and processing of various cytological specimen, preparation and quality control of various stains and reagents used in cytology, all routine and special staining techniques in cytology, FNAC, immunocytochemistry, flowcytometry, automation in Cytology

Cytogenetic

Structure and molecular organization of chromosomes, identification of human chromosomes, karyotyping, direct chromosome preparation of Bone Marrow cells, culture techniques, banding techniques, sex Chromatin bodies, autoradiography of human chromosomes, chromosome Identification by image analysis and Quantitative cytochemistry, clinical Manifestations of chromosome disorders

Practicals:

1. Morphology of normal and abnormal cells
2. Karyotyping technique
3. Immuno-histochemistry techniques
4. FNAC technique

Books Recommended:

- Lynch's Medical Laboratory Technology
- Diagnostic Cytology Koss. Volume I & II
- Henry's Clinical Diagnosis&Management by Laboratory method.
- Basic Histopathology – Stevens.
- Practical Cytology – Astarita.
- Hand book of Medical Laboratory Technology – Robert H. Carman

8TH SEMESTER COURSES

1. RESEARCH PROJECT
2. SEMINAR
3. MEDICAL SOCIOLOGY
4. BIOETHICS

RESEARCH PROJECT Credit Hours: 6(0+6)

Course Objectives:

- Students will learn some basic research methodology and gain knowledge about research.
- It will hopefully result in some of presentation or publication for the students and will provide a research oriented environment

Course contents:

During last year each student should select a topic of research report with consultation of his/her supervisor and shall prepare and submit research report to Khyber Medical University by the end of last year.

Practical:

A hard copy of research project should submit to examination for degree requirements fulfillment.

SEMINAR Credit Hours:1(1+0)

During last year each student should select a topic of research work with consultation of his/her supervisor and shall present his/her research work through a seminar.

MEDICAL SOCIOLOGY Credit Hours 3(2+1)

Course Objectives:

- To produced knowledge about the significance and scope of sociology as a science, their relation with other sciences.

Course Contents:

Definition and scope of sociology, sociology is a science, Islamic Sociology, medical Sociology, introduction contribution of sociology to medicine, health and disease, social definition of illness, social and emotional component of illness, patient and paramedic, paramedics view of disease and patient, psychology of patient / paramedic relationship, mental illness sociological perspective, social implication of mental illness, rehabilitation, physical, mental handicap, method in rehabilitation: Guidance counseling and vocational training, social disorganization, the concept and factor of social organization, family, group and community disorganization, problem of community problem of crime, method of treatment and preventative measure, educational problems, deterioration of education standard in school, college and university, health problems, illness behavior, delivery and utilization of health services, introduction to applied sociology, definition of applied sociology, nature and causative analysis of social problem and the role of sociologist in solving social problems, application of social research in social problems social servu and social research, nature purpose and function

RECOMMENDED BOOKS:

- Medical sociology by William C Cuckerham in 1978 printed by USA Health education by Laurna Robinson Wesley F Alles in 1994 by Times Mirror /Mosby College Publishing ST Liois Toronto
- Social psychology of health by Shirlynn Spacapan Stuart Oskanp Edition by SAGE publication New Delhi, New York, in 1987

BIOETHICS Credit Hours 2(2+0)

Course Objectives:

To introduced the students with medical ethics, their behavior with patients and medical Staff.

Course Contents:

Ethical conduct, relationship with patient, surgeon, physician, nurse, social workers and co-workers, preparation and uses of records, report, physical plant, equipments. The implementation of and confirmation to the rules of professional context and understanding, the paramedic liability and obligations in the case of medico legal action, a wider knowledge of ethics relating to current social and medical policy in the paramedic society as a professional association, the role of international health agencies such as world health organization.

Recommended Books:

- Medical ethic by Dr. Mehmoond Alam in 2006 by Health Department NWFP

**PROPOSAL FOR LAUNCHING
BSc (Hons) in Allied Health Sciences for Dental Technicians**

A. ACADEMIC DETAILS	
1	Faculty/Department: Dental
2	Name of the Program: Bachelor of Science (BSc Hons)
3	Mission of the Program: <ul style="list-style-type: none"> • To meet the global standards of teaching in health and allied sciences • To foster learning in a professional environment with quality dental care.
4	Objectives of the Program: <ul style="list-style-type: none"> • To prepare a team of dental auxiliaries who can effectively assist senior health professionals in the delivery of quality dental care at all levels. • Exhibit professionalism and ethical conduct. • Demonstrate critical thinking skills while ensuring patient safety and comfort.
5	Outcomes of the Program: The student will demonstrate clinical competency by mastering both the didactic and clinical portions of the program in general and the students will be able to: <ul style="list-style-type: none"> - Assist senior dental professionals in imparting quality dental care. - Perform simple dental procedures thereby preventing and stunting dental disease. - Assist clinicians in providing prosthetic treatments with knowledge of the impact of lab procedures on clinical outcomes. - Protect patients and the healthcare team from radiation. - Take and follow instructions of clinicians in taking radiographs - Communicate with patients and deal efficiency with all depts in delivering quality dental care. - Manage clinics and laboratories effectively with senior dental professionals to enable cost effective and high quality dental services.
6	Rationale for the Program: <ul style="list-style-type: none"> • To initiate development in the field of Dental health and allied sciences. • Keeping in view, the scarcity of programs offered in Dental allied sciences; this program will enable individuals to keep pace with the recent advances in these disciplines. • Educate the auxiliaries already working in a dental setup to upgrade their career.
7	Brief Description of the Program: Proposed Bachelors of Science (B.Sc.) is a 4 year academic degree which fulfils requirement to become a certified professional. B.Sc. program will be offered in following disciplines: <ul style="list-style-type: none"> • Dental Hygienist • Dental Technologists In addition to that , associate degree will be offered in the following which will be 2 years program: <ul style="list-style-type: none"> • Dental surgery assistant • Dental radiography
8	Duration: 2-4 years (according to the program)

9	Venue(s): On Site/Off Site/Both On & Off Site (<i>tick one/strike-through the ones not applicable; if Off Site, give details</i>)
10	Programme Scheduling Format: <ul style="list-style-type: none"> • Morning/Evening/Weekend (<i>tick one/strike-through the ones not applicable</i>) • Bi-Semester/Trimester/Semester+Summer Session/Annual/Bi Annual (<i>tick one/strike-through the ones not applicable</i>)
11	Proposed Date of Commencement: 2018 for Dental Surgery Assistant 2019 for Dental Hygienist/ Dental Radiography 2020 for Dental Technologists
12	Mode of Study/Examination: Semester system
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) <p>1) Full time Dedicated faculty Full time dedicated faculty requirement includes one Professor and one Associate Professor if available in the field of dental technologist field (Dental Ceramist and Dental Technologist)</p> <p>2) Shared faculty from other departments Shared faculty from other departments at the Professor and Associate Professor level will be available for teaching relevant subjects. Two Lecturers are required at junior level for this program. Faculty holding at least Master's degree in the following disciplines:</p> <ul style="list-style-type: none"> • Anatomy • Physiology • Pharmacology • Oral anatomy • Community dentistry • Dental material • Periodontology • Operative dentistry • Prosthodontics • Orthodontics • Oral pathology • Oral & Maxillofacial Surgery • Psychology • Sociology • Miscellaneous (English, Islamiat, Pakistan Studies and computer skills required are already available to teach other undergrad program)
14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) Program -DSA <ul style="list-style-type: none"> • Coordinator for Dental Assistants – 01 • Radiographer – 01
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) <ul style="list-style-type: none"> • Designated Lecture Halls with multimedia (1) One class room or well-equipped lecture hall of 50 student capacity is required initially and number will be increased up to four for each batch every year till fourth year.
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) <ul style="list-style-type: none"> • Fully functional ceramic/acrylic lab and cast RPD work
	N/A

17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories:
18	Minimum Entry Level: <ul style="list-style-type: none"> Intermediate science (pre-medical) or equivalent examination securing more than 50% marks.
19	Admission Criteria: As per BU rules
20	Additional/Different Examination Requirement <i>(Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue).</i>
21	Number of Admissions Expected for First Intake: 25
22	Number of Admissions Planned/Expected for Subsequent Intakes: 25
23	Referred by: FBOS: Approved in 12th FBOS meeting on 21st August, 2017.
24	Complete Plan of Studies, inclusive of complete Roadmap: <i>(Attach as Annex 'A')</i> Enclosed
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) <i>(Attach as Annex 'B')</i> Enclosed

B. FINANCIAL DETAILS	
1	Source of Funding: <ul style="list-style-type: none"> BU: Fully/Partially: Public Sector (B1): Fully/Partially <i>(provide complete details; attach MOU, agreement etc.)</i> NNGO (B1): Fully/Partially <i>(provide complete details; attach MOU, agreement etc.)</i> INGO (B1): Fully/Partially <i>(provide complete details; attach MOU, agreement etc.)</i> UN/IGO (B1): Fully/Partially <i>(provide complete details; attach MOU, agreement etc.)</i>
2	Degree Duration: Annual or Semester System: Semester: 4 for DSA
3	Expected fee to be charged based on Cost & Benefits Analysis: <i>(show working)</i> Per annum Per annum fee: Rs 20,000/- DSA
4	Expected Number of students for 1st & 2nd Intakes: 25 per intake
5	Expected Earning from first Intake (B5): <i>(Show working)</i> Dental Assistant 1 st year $30,000 \times 25 = 750,000$ (Including admission fee) per annum Dental Assistant 2 nd Year $20,000 \times 25 = 500,000$
6	Expected Earnings for the Next Five Years (B6): <i>(show working)</i> $Dental\ Assistant = (25\ students/year) \times 5 = 5,750,000/-$
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): <i>(Show working)</i> <i>Coordinator for dental assistants : $40,000/- \times 12 = 480,000/-$ Per annum</i>
8	Cost of Additional Classrooms (B8): <i>(Include furniture, technical aids etc)</i>
9	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B9): <i>(show details)</i> Rs 500,000/-
10	Off-Site rental Expenses and Cost of other Fixtures (B10): <i>(Show details)</i> -
11	Miscellaneous Expenses required for Starting the Program (B11): - Advertisement:

	- Printing & Stationery - Admin Cost - Any other - Total: 75,000/-
12	Annual Recurring Expenditures in Subsequent Years (B12): Total: Rs 555,000/-
13	Total Cost of the Programme (B13): [Add B(7) to B(13)] Rs 1,055,000/-
14	Net Cost of the Programme (B14): [Subtract B(1) from B(13)]
15	Net Earnings in First Year (B15: [Subtract B(14) from B(5)]
16	Projected Annual Gross Earning in Subsequent Years (B 16): (show details & working; add 10% towards all expenses in subsequent years.)
17	Projected Annual Net Earning in Subsequent Years: [Subtract B(12) from B(16)]

Annexure "A"

Semesters: Semester System

Program(s): Dental Surgery Assistant (4 semesters)

Duration: 2 years Dental surgery assistant)

S.No.	SCHEDULE	DATE
1	Date for inviting applications	07 th Nov.
2	Last date for submitting applications	22 nd Nov.
3	Entry Test	28 th Nov.
4	Display of the Initial Merit List	01 st Dec.
5	Last date for Inviting objections to the Initial Merit List including re-calculation of marks	04 th Dec
6	Interviews for verification of Original Documents and Submission of Pay Orders for Final Allocation of all categories on Merit Cum Choice Basis	05 th Dec.
7	Display of the Final Merit List	15 th Dec.
8	Start of First Semester	1 st Jan. (next year)

The maximum duration for completion of course will follow the BU policy.

Annexure "B"**Dental Assistant**

<u>1st Semester</u>	<u>2nd Semester</u>
<ul style="list-style-type: none"> • Psychology • Sociology • Microbiology & Infection Control - English Foundation • Computer Skills • Medical Terminology - Physiology • Pharmacology – Anatomy 	<ul style="list-style-type: none"> • Oral Anatomy & Tooth Morphology • Introduction to Removable Denture • Dental Pharmacology • Dental Materials • Community Dentistry • Basic Technology • Sterilization & Disinfection • Dental Radiology
<u>3rd Semester (clinical rotations)</u>	<u>4th Semester (clinical rotations)</u>
<ul style="list-style-type: none"> • Periodontology • Operative Dentistry • Prosthodontics • Orthodontics • Oral & Maxillofacial Surgery 	<ul style="list-style-type: none"> • Complete Denture • Dental Material • Orthodontics • Partial Denture • Conservation Technology • Basic Technology

Slide-1**ITEM NO: 3023**

**LAUNCH PROPOSAL OF
BS IN ALLIED HEALTH SCIENCES
(MEDICAL LAB TECHNOLOGY)**

Dr. Mehreen Lateef, PhD
HOD, MDRL

Slide-2**Introduction**

Title	Name
UG Degree Program	Bachelor of Science in Medical Lab Technology
Short Title	BS MLT
Department	MDRL
Proposed Name	Institute of Allied Health Sciences

Objective. To deliver quality learning and develop expertise in technological practices required for Professional Clinical Laboratory Scientist.

Eligibility Criteria for Admission. Candidates with at least 50% marks in intermediate with premedical science or equivalent (*A-level with Physics, Chemistry and Bio) are eligible to apply.

Slide-3**Programme Overview**

Study System	Semester System
Course Title	BS in Medical Laboratory Technology
No of Regular Semesters	8
Semester Duration	18 weeks
Total Credit Hours	130 (HEC recommends: 124-136)
Number of Courses per Semester	4-6
Course Load per Semester	15-18 Credit Hours
Estimated Student Intake per Year	30 students (one intake per year)
Tentative commencement date	Spring 2018

Slide-4**Curriculum - Road Map**

Semester	Code	Title of Course	Cr Hrs
I (18 Cr Hrs)	MLT101	Biochemistry -I	3 + 1
	MLT102	Human Physiology-I	3 + 1
	MLT103	Human Anatomy-I	3 + 1
	MLT104	English	2 + 0
	MLT105	Pakistan Studies	2 + 0
	MLT106	Computer Skills	1+ 1
II (18 Cr Hrs)	MLT107	Biochemistry -II	3 + 1
	MLT108	Human Physiology-II	3 + 1
	MLT109	Human Anatomy -II	2 + 1
	MLT110	General Pathology-1	2 + 1
	MLT111	English	2 + 0
	MLT112	Islamic Studies	2 + 0
III (18 Cr Hrs)	MLT201	General Pharmacology-I	2+ 1
	MLT202	Hematology-I	2+ 1
	MLT203	Human Genetics	2+ 1
	MLT204	Communication Skills	2+ 1
	MLT205	Medical Microbiology-I	2+ 1
	MLT206	Clinical Bacteriology	2+ 1
IV (17 Cr Hrs)	MLT207	General Pharmacology-II	2+ 1
	MLT208	Medical Microbiology-II	2+ 1
	MLT209	Hematology -II	2+ 1
	MLT210	Chemical Pathology	2+ 1
	MLT211	Clinical Virology/Mycology	2+ 1
	MLT212	Behavioral Science	2+ 0

TRANSCRIPT OF PRESENTATION BY HOD MDRL**Slide-1**

ITEM NO: 3023

LAUNCH PROPOSAL OF BS IN ALLIED HEALTH SCIENCES
(MEDICAL LAB TECHNOLOGY)

Dr. Mehreen Lateef, PhD

HOD, MDRL

Slide-2
Introduction

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Slide-4
Curriculum - Road Map

Semester	Code	Title of Course	Cr Hrs
I (18 Cr Hrs)	MLT101	Biochemistry -I	3 + 1
	MLT102	Human Physiology-I	3 + 1
	MLT103	Human Anatomy-I	3 + 1
	MLT104	English	2 + 0
	MLT105	Pakistan Studies	2 + 0
	MLT106	Computer Skills	1+ 1
II (18 Cr Hrs)	MLT107	Biochemistry -II	3 + 1
	MLT108	Human Physiology-II	3 + 1
	MLT109	Human Anatomy -II	2 + 1
	MLT110	General Pathology-1	2 + 1
	MLT111	English	2 + 0
	MLT112	Islamic Studies	2 + 0
III (18 Cr Hrs)	MLT201	General Pharmacology-I	2+ 1
	MLT202	Hematology-I	2+ 1
	MLT203	Human Genetics	2+ 1
	MLT204	Communication Skills	2+ 1
	MLT205	Medical Microbiology-I	2+ 1
	MLT206	Clinical Bacteriology	2+ 1
IV (17 Cr Hrs)	MLT207	General Pharmacology-II	2+ 1
	MLT208	Medical Microbiology-II	2+ 1
	MLT209	Hematology -II	2+ 1
	MLT210	Chemical Pathology	2+ 1
	MLT211	Clinical Virology/Mycology	2+ 1
	MLT212	Behavioral Science	2+ 0

Slide-5
Curriculum – Road Map

Available Faculty

- 1 PhD
- 3 MSc
- 2 Medical Technologist
- 2 General subjects lecture

Required Faculty

- Senior Medical Technologist as full time coordinator
- One Clerk

Shared Faculty

- 2 PhDs
- 3 MBBS

Available to teach; Anatomy, Physiology, Pathology and Pharmacology

Slide-6
Class Room & Laboratory Requirements

Available Labs

- MDRL Lab
- Histopathology Lab
- Skill Lab
- PNS Shifa clinical labs required in final year (MOU be signed)

Required Class/Lab

- One class room for 50 students
- One lab equipment

Slide-7
Comparative Fee Structure

	Universities Offering Programme	Fee/year for BS in Medical Technology
1.	Ziauddin University, Karachi	75,000/year
2.	Dow Medical University, Karachi	130,000/year
3.	Agha Khan University, Karachi	325,000/year
4.	King Edward Medical College, Lahore	36,000/ year
5.	Isra University, Islamabad	132,000/ year
6.	Azra Naheed Medical College, Lahore	120,000/year
7.	Hafeez Medical College, Peshawar	70,000/year
Proposed Fee of this program		Rs 1,20,000 per year (one intake)

Slide-8
Financially Viability

	Financial Effects
Expected Earning / year	4.35 million
Expected Earning/ 5 years	54.1 million
Annual Expenditure	6.04 in 1 st year or 3.52 million subs. years
Expenditure for 5 years	17.71 million
Total Cost	6.04 million/ year or 20.14 million/5 year
Net cost / 5 years	33.96 million/5 year
Net earning/ year	29.61 million
Gross earning in subsequent years	50.26 million
Net earning in subsequent years	30.12 million

Slide-9
Recommendation

Approval to launch 'BS Medical Lab Technology', (BS MLT) may please be accorded from Spring 2018 intake

Slide-10

An Academic year will be divided into **TWO SEMESTERS**. Each semester will be of **18 Weeks Duration**, the break up will be as follows:

- Pre semester admissions02 weeks
- First (Spring) Semester teaching and examinations18 weeks
- *Inter semester break (Winter)04 weeks
- Second (Fall) Semester teaching and examinations18 weeks
- *Session break (Summer)10 weeks

Slide-11

Admission Procedure

- BU Entrance Test
- Interview By Committee
- Final approval as per BU admission policy
- Admission in BS

TRANSCRIPT OF PRESENTATION BY AG PRINCIPAL DENTAL SECTION**Slide - 1**

Allied Health Sciences
Dental Care Professionals
(Dental Surgery Assistant)

Slide - 2

Name	Associate Degree
Duration	Dental Surgery Assistant (2 years)
Venue and forma	BUMDC, Morning, Bi-semester

Slide - 3**Requirement**

Shared Faculty	Infra structure
Program Coordinator	Designated Lecture Hall with multimedia
Medical/Dental Sciences Subjects	(25 students)
Psychology & Sociology	
Compulsory subject	

Slide - 4**Admissions 2018**

Entry Level	Admission Criteria	Expected intake
FSc (Pre-Med)	As per BU Rules	25
50% marks		

Slide - 5**Plan of Studies**

2 semesters per year

End semester exam

Continuous assessments during semesters

*Semester system as per BU rules

	Subject	Credit Hours
1 st Semester	Pharmacology	3.0
	Medical Terminology	0.5
	English Foundation	2.0
	Psychology	2.0
	Physiology	2.0
	Anatomy	2.0
	Computer Skills	2.0
	Sociology	2.0
	Microbiology & Infection Control -	3.0
2 nd Semester	Dental Materials	2.5
	Dental Radiology	2.0
	Dental Pharmacology	2.0
	Community Dentistry	2.0
	Cross Infection Control	2.0
	Oral Anatomy & Tooth Morphology	2.0

3 rd Semester (clinical rotations)	Periodontology	5.0
	Operative Dentistry	3.5
	Orthodontics	2.0
	Oral & Maxillofacial Surgery	3.5
	Prosthodontics	3.5
4 th Semester (clinical rotations)	Periodontology II	5.0
	Operative Dentistry II	3.5
	Oral Pathology	3.0
	Radiology II	3.5
	Community Dentistry II	3.5
	General Diseases & Medical Emergencies	3.5
Total Credit Hours		70.5

Slide - 6**Financial Details**

S.No	Dental Surgery Assistant	
1	Source of Funding	Bahria University
2	Duration	4 semesters
3	Expected Fee	Rs.10,000/- admission + security deposit Rs.20,000/- per annum
4	Expected Number of students for 1st & 2nd Intakes	25
5	Expected Earning from first Intake	Dental Assistant 1st year $30,000 \times 25 = 750,000/-$ (Including admission fee) per annum Dental Assistant 2nd Year $20,000 \times 25 = 500,000/-$
6	Expected Earnings for the Next Five Years	Dental Assistant = (25 students/year) X 5 = 5,750,000/-
7	Total Estimated Salaries of all Additional Human Resources per annum	Coordinator: shared
8	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories	Rs. 500,000/-
09	Miscellaneous Expenses	Rs. 75,000/-
10	Annual Recurring Expenditures in Subsequent Years	Rs. 75,000/-
11	Total Cost of the Programme	Rs. 575,000/-

Slide - 7**Projected Annual Earning**

Year	Expenditure	Earning
1st Year (1)	Rs.575,000	Rs.750,000
2nd Year (2)	Rs.75,000	Rs.1,250,000
Total	Rs.650,000	Rs.1,950,000

Appendage 3024**Introduction of New BS Program, "BS Economics and Finance"****Background**

The discussion regarding Strategic Plan of Bahria University Karachi campus has highlighted the importance of introduction of new BS programs along with the existing ones. In order to meet the challenges of the competitive market, there is a need to bring diversity in the university graduate programs. It is therefore suggested to introduce BS Economics in the upcoming semester. The BS Economics program helps students to think logically and improve their ability to use economic and fiscal concepts to analyze "real world" problems and opportunities. This is a unique program that emphasizes qualitative and quantitative approach to dealing with economic and fiscal problems in both the public and private sectors. Currently its being offered by IBA, SZABIST, University of Karachi in Karachi, and Islamic University, NUML, NUST and COMSATS Islamabad.

HR Implications:

There is no HR implication, as the existing university faculty and administrative staff will be sufficient for the said purpose.

Financial Implications:

Positive as 30 BS students will be inducted in the first semester. Financial detail attached in attached proforma as Annex 1.

Discussion

HOD MS BUKC, explained that in the light of rationale given under background, there is a need to expand portfolio in terms of academic programs offering, Economics and Financing, an important discipline to be offered. Hence, it is recommended that Board of There was a debate on whether this offering is "BS Economics" or "BS Economics & Finance". Participants are of the view that this should be a well thought decision because the title will have implications on its intake. Hence as per the choice of the title, in case, if it is "BS Economics & Finance", more electives from "Finance" perspectives need to be added to the existing list of electives so that it covers economic as well as finance dimensions as per title of the program. The house agreed to the point and recommended to take to the ACM for decision.

Annex 1

Department of Management Sciences (BUKC)
PROPOSAL FOR LAUNCHING
BS Economics & Finance

A. ACADEMIC DETAILS	
1	Faculty/Department: Management Sciences
2	Name of the Programme: 4 years BS Economics
3	Mission of the Programme: To produce aware citizen who can take sound economic decisions on the basis of ground realities for organizational development and society as a whole
4	Objectives of the Programme: To impart high quality education on economics at the bachelors levels in Karachi.
5	Competitive Landscape of Legal Education Currently its being offered by IBA, SZABIST, University of Karachi in Karachi, along with other public universities with minor variations in the course titles. However, need of quality education of Economics at the bachelors level still exists as there has been mushroom growth in Business education's institutions but the allied subjects of social sciences like Economics has attracted lesser degree of attention of universities. As a result, there is a scarcity of quality graduate in the field of Economics and Finance.

6	Rationale for the Programme: The discussion regarding Strategic Plan of Bahria University Karachi campus has highlighted the importance of introduction of new BS programs along with the existing ones. In order to meet the challenges of the competitive market, there is a need to bring diversity in the university graduate programs. It is therefore suggested to introduce BS Economics in the upcoming semester. The BS Economics program helps students to think logically and improve their ability to use economic and fiscal concepts to analyze "real world" problems and opportunities. This is a unique program that emphasizes qualitative and quantitative approach to dealing with economic and fiscal problems in both the public and private sectors. <ul style="list-style-type: none">• Such program is needed in Karachi Market• BUKC's academic programs need to be diversified• Bahria University brand is stronger than most competitors in Karachi• Karachi campus infrastructure and security environment is conducive for attracting students
7	Brief Description of the Programme: BS Economics & Finance program will be 4 years program spreading over 8 semesters. Entire program has been developed under the guidelines provided by the HEC for bachelors program. The program has been designed in a way that it would be catering the need of assistance for social policy makers at the same time the graduates of the program will be able to make their career in indigenous organizations in the area of organizational economics and finance.
8	Duration: 4 years
9	Venue: Bahria University, Karachi Campus
10	Programme Scheduling Format: Eight semesters in morning and Afternoon from 2:30 till 6:00 pm
11	Proposed Date of Commencement: To be decided by the competent authority, Preferably from Spring 2018.
12	Mode of Study/Examination: As per the policy of BU/ HEC
13	Additional Faculty Member(s) Required: Not needed immediately
14	Additional Skilled-Worker(s) Required: Not needed immediately
15	Additional Classroom(s) required: Not needed
16	Additional Requirement for Laboratories: Not needed
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Not needed immediately
18	Minimum Entry Level: Intermediate/A level
19	Admission Criteria: As per prevailing BU and HEC policy
20	Additional/Different Examination Requirement Not needed
21	Number of Admissions Expected for First Intake: 15
22	Number of Admissions Planned/Expected for Subsequent Intakes: 15 in the first three years and then 15 students for subsequent years
23	Referred by: The Dean MS&SS
24	Complete Plan of Studies, inclusive of complete Roadmap: Road map is attached
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended)

	As per BUIC curriculum which is already being applied for similar program. Minor changes in electives will be required if approved the title " BS Economics & Finance" (Annex 2)
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B. FINANCIAL DETAILS																																																																																																																														
1	Source of Funding: BU: Fully:																																																																																																																													
2	Degree Duration: 4 years				Semesters system Semester: Number of Semester: 8																																																																																																																									
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	<table border="1"> <thead> <tr> <th></th><th colspan="3">Students(minimum)</th><th colspan="2">Fee per Student</th><th colspan="3">Total Fee</th></tr> <tr> <th>Semester</th><th>Fresh</th><th>Existing</th><th>Total</th><th>Fresh</th><th>Existing</th><th>Fresh</th><th>Existing</th><th>Total</th></tr> </thead> <tbody> <tr> <td>Spring 2018</td><td>15</td><td>0</td><td>15</td><td>104,000*</td><td>0</td><td>15,60,000</td><td>0</td><td>15,60,000</td></tr> <tr> <td>Fall 2018</td><td>15</td><td>15</td><td>30</td><td>104,000</td><td>73,000</td><td>15,60,000</td><td>10,95,000</td><td>26,55,000</td></tr> <tr> <td>Spring 2019</td><td>15</td><td>30</td><td>45</td><td>104,000</td><td>73,000</td><td>15,60,000</td><td>21,90,000</td><td>37,50,000</td></tr> <tr> <td>Fall 2019</td><td>15</td><td>45</td><td>60</td><td>104,000</td><td>73,000</td><td>15,60,000</td><td>32,85,000</td><td>48,45,000</td></tr> <tr> <td></td><td colspan="7">Total Earnings</td><td>1,28,10,000</td></tr> </tbody> </table>									Students(minimum)			Fee per Student		Total Fee			Semester	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total	Spring 2018	15	0	15	104,000*	0	15,60,000	0	15,60,000	Fall 2018	15	15	30	104,000	73,000	15,60,000	10,95,000	26,55,000	Spring 2019	15	30	45	104,000	73,000	15,60,000	21,90,000	37,50,000	Fall 2019	15	45	60	104,000	73,000	15,60,000	32,85,000	48,45,000		Total Earnings							1,28,10,000																																																							
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7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (<i>Show working</i>) 80,000/monthx3(faculty members)x12(months) = 2,880,000																																																																																																																													
8	Cost of Additional Laboratory Equipment/Tools (B8): (<i>show working</i>) Not needed																																																																																																																													
9	Cost of Additional Classrooms (B9): (<i>Include furniture, technical aids etc</i>) Not needed																																																																																																																													
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (<i>show details</i>) Not needed																																																																																																																													

11	Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details) Not needed																
12	Miscellaneous Expenses required for Starting the Program (B12): <ul style="list-style-type: none"> - Advertisement: - Printing & Stationery - Admin Cost - Any other - Total: Lumpsum – Rs. 500,000/ 																
13	Annual Recurring Expenditures in Subsequent Years (B13): <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">- Salaries:</td> <td style="text-align: right;">80,000x3x12 = 2,880,000</td> </tr> <tr> <td>- Rentals:</td> <td style="text-align: right;">_____</td> </tr> <tr> <td>- Subscriptions/Memberships:</td> <td style="text-align: right;">_____</td> </tr> <tr> <td>- Advertisements:</td> <td style="text-align: right;">300,000</td> </tr> <tr> <td>- Printing & Stationery:</td> <td style="text-align: right;"><u>500,000</u></td> </tr> <tr> <td>- Admin Cost</td> <td style="text-align: right;"></td> </tr> <tr> <td>- Any other</td> <td style="text-align: right;"></td> </tr> <tr> <td>Total:</td> <td style="text-align: right;">3,680,000</td> </tr> </table>	- Salaries:	80,000x3x12 = 2,880,000	- Rentals:	_____	- Subscriptions/Memberships:	_____	- Advertisements:	300,000	- Printing & Stationery:	<u>500,000</u>	- Admin Cost		- Any other		Total:	3,680,000
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- Any other																	
Total:	3,680,000																
14	Total Cost of the Programme (B14): [Add B(7) to B(12)] Rs. 3,680,000																
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] Rs. 2,880,000																
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] Revenue – total expenditure + Net Earning 1,28,10,000 – 3680,000 = Rs. 9,130,000																
17	Projected Annual Gross Earning in Subsequent Years (B 17): (show details & working; add 10% towards all expenses in subsequent years.) Rs. 9,130,000 – 91,300 = Rs. 90,038,700/																
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] Rs. 90,038,700/																

Annex 2**Complete plan of studies:**

BS Economics and Finance (133 Cr)		Bahria University			
First Semester					
S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	ENG 105	English-I	Core	3	
2	QTM 101	Business Maths-1	Core	3	
3	ECO 110	Microeconomics- I	Core	3	
4	MIS 161	IT Skills	Self-grooming	3	
5		HSS 108	Intro to Sociology	3	
6		MGT 111	Principles of Management	3	
Second Semester					
S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	ISL 101	Islamic Studies	Core	3	
2	QTM 105	Introduction to Statistics	Core	3	
3	QTM 120	Numeracy Skills	Self-grooming	3	QTM 101
4		ECO 121	Macroeconomics-I	3	
5		ECO 111	Microeconomics-II	3	
6		MGT 111	Principles of Management	3	
Third Semester					
S.No	Codes	Courses	Level	Credit Hours	PRE-REQ

1	SOC 240	Pakistan Studies	Core	3
2	ECO 201	Financial Institutions and Markets		3
3	ECO 122	Macroeconomics-II		3
4	ECO 202	Issues in Pakistan Economy		3
5	ENG 132	Oral Communication and Public speaking Skills	Self-grooming	3 ENG 111
6	QTM 232	Statistical Inference	Core	3

Fourth Semester

S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1		ECO 301	Fundamentals of Econometrics	3	
2	ECO 302	Issues in Pakistan Economy		3	
3	ECO 304	Business Taxation and Public Finance		3	
4	RMT 240	Research Methods & Techniques	Core	3	
5	ECO 340	Development Economics		3	ECO 110, ECO 120
6	ENG 243	Business Communication Skills	Self-grooming	3	ENG 132

Fifth Semester

S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	ECO 306		International Economics & Finance	3	
2	ECO 307		Money and Banking	3	
3	ECO 308		Natural Recourse Economics	3	
4	MGT 311	Career Exploring		Self-grooming	3
5	ECO 309		Monetary Theory & Policy	3	

Sixth Semester

S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	ECO 362		Managerial Economics	3	
2	HSS 301	Social and Psychological Development		Self-grooming	3
3	ECO 401		Financial Economics	3	
4	ECO 501		Banking and Taxation	3	
5	ECO 404		Money and Capital Markets	3	

Seven Semester

S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	ECO 402		Project Analysis	3	
2	ECO 403		Trade Policy	3	
3	MGT 211	Self-Management	Self-grooming	3	HSS 301
4	Elective 1			3	
5	Elective-2			3	

Eight Semester

S.No	Codes	Courses	Level	Credit Hours	PRE-REQ
1	PRO 450		Project	4	
2	MGT 463	Corporate Skills	Self-grooming	3	MGT 211
3	Elective-3			3	
4	Elective-4			3	
5	Elective-5			3	

LIST OF ELECTIVES

S. No.	Course Code	Title of the Course	Credit Hours
1	ECO 502	Industrial Economics	
2	ECO 503	Budgeting and Financial Planning	3
3	ECO 504	Advanced Topics in Microeconomics	3
4	ECO 505	Advanced Topics in Macroeconomics	3
5	ECO 506	Poverty & Income Distribution	3
5	ECO 507	International Economics	3
7	ECO 508	Labor Economics	3
8	ECO 509	Investment Banking & Security Analysis	3
9	ECO 510	Islamic Economics	3
10	ECO 511	Urban Economics	3
11	ECO 512	General Equilibrium and Welfare Economics	3
12	ECO 513	Economics of Regulation and Competition Policy	3
13	ECO 514	International Peace and Security	3
14	ECO 515	Union and Labor Laws	3
15	ECO 516	Agricultural Economics and Food Policy	3

15. Course Layout of the Undergraduate Program

Year	Credits	Compulsory Requirement for Bachelors(HON S) Program	Electives	General Science Requirements	Requirements Towards Major
Total	133	28	15	39	51
YEAR 1					
Semester I	18	6	3	9	0
Semester II	18	6	0	12	0
YEAR 2					
Semester III	18	6	0	6	6
Semester IV	18	3	0	9	6
YEAR 3					
Semester V	15	3	0	3	9
Semester VI	15	0	6	0	9
YEAR 4					
Semester VII	15	0	3	0	12
Semester VIII	12	0	3	0	9
Internship/ Project Report	4		4		

Appendage 3025

Title: Establishment of Department of Law at BUKC

Background / Discussion

Increasing open debate on governance, human rights and judiciary, in recent years in Pakistani media, is promoting socio-legal awareness in Pakistan. This increased awareness is attracting young minds towards law discipline to make their career as legal professionals and law academics. However, universities are not responding proportionately to the emerging need in this reference as 28 universities/academic institutions, out of 200 HEC approved universities/DAIs, have so far offering the law programs in the country. And out of this number very few academic institutions have come up with the quality law programs at the under graduation, graduation and post graduation levels so far. Hence, gap in supply and demand of socially sensitized law professionals exist in Pakistan in general and in Karachi market in particular. Moreover, there is a need to design the law programs with a social touch at the degree, diploma and certificate levels.

It is feared that the widening gap between the supply and demand of quality legal professionals may pose challenge for society in extending justice to the people through socially sensitized legal advocates at affordable price.

Bahria University has already taken lead in establishing Law department at its Islamabad campus under the auspices of the Faculty of Management & Social Sciences which is going good and imparting law education of appropriate standard under the guide line of Pakistan Bar Council. In order to fill the gap of law professionals, BU may establish a law school/department at its Karach Campus (BUKC) by replicating its success achieved in Islamabad in this reference. Dully filled Proforma in this reference is attached as **Annex1**.

In 2014, approval for conducting LLB program at BUKC was accorded in 22nd ACM (point 2231) however it could not be started due to some plausible reasons. Hence, it is again presented before the august house for the establishment of Law department at BUKC. Detailed requirement for establishing the Law Department is attached as **Annex 2**.

HR Implications:

A senior judge (Retired) or PhD holder in Law and minimum number of faculty members as per the guidelines of Pakistan Bar Council for establishing law school/department is needed.

Financial Implications: Positive as a new program even with minimum strength will be financially viable. (**Annexure A of Proforma**)

Discussion

HOD MS BUKC, who chaired highlighted that in the light of above background, there is a need to establish a Law School/Department at the BUKC as BU, as a public university, shares the responsibility with state for promoting justice in the society. And one of the sources of promoting justice is developing new and strengthening the existing legal institutions in the country by adding the numbers of socially sensitized lawyers in the country. He also highlighted that approval for conducting LLB at BUKC was accorded in 22nd ACM (point 2231) however it could not be started due to some plausible reasons. One of those reasons was the absence of the proper departmental framework. Therefore the agenda point has been brought forward to highlight the need of establishing a Law department for offering LLB/LLM program. The idea was supported by the members of FBOS and recommended that the point may be taken to the ACM for approval so that a proper law department may be established at the BUKC.

Annex 1

PROPOSAL FOR LAUNCHING LLB at BUKC

A. ACADEMIC DETAILS	
1	Faculty/Department: Department of Law
2	Name of the Programme: 5 YearLLB
3	Mission of the Programme: To produce socially conscious lawyers who are equipped with substantial knowledge of Law and aspired to have a high level professional commitment.
4	Objectives of the Programme: To impart high quality legal education in Karachi
5	<p>Competitive Landscape of Legal Education</p> <p>There are 28 local Universities approved by Pakistan Bar Council awarding LLB degrees in Pakistan. Numbers of colleges affiliated with the Universities are very high only one Punjab University has 48 colleges affiliated and giving LLB degrees in their evening classes.</p> <p>In Karachi following Universities and colleges are engaging in legal education and awarding LLB degrees</p> <ol style="list-style-type: none"> 1. S M Law College (affiliated with Karachi University) 5 Year degree morning classes ,3 years degree with evening classes and LLM 2. Shaheed Zulfiqar Ali Bhutto University of Law , 5 year morning, 3 year eveningand LLM 3. Hamdard University, 5 years LLB- Morning and LLM 4. Karachi University- 5 year LLB – Morning and LLM 5. Dadabhoj Institute of Higher Education, 5 year morning, 3 years degree with the evening classes and LLM 6. Government Islamia Law College, 3 years degree program 7. Federal Urdu University 3 years degree 8. Government Degree Science and Commerce College , 5 years degree with morning classes <p>In Karachi along with 3 years LLB (after 14 years of education) and 5 years LLB (after intermediate), certain colleges are operating as coaching centers for foreign universities and their students are enrolled with foreign universities. Examination and paper checking is done by these foreign universities and then degrees are issued by them. These international programs are normally run in the evening time</p> <p>International LLB degrees are given by these schools after three years of legal education and students are given admission only if they have done A levels.</p> <p>Following universities and colleges are running external program in Karachi based on international LLB degree</p> <ol style="list-style-type: none"> 1. SZABIST 3 year LLB (University of London) International degree (200 applicants) 2. L'ecole 3 year LLB (University of London) International degree (30 applicants) 3. Themis School of Law 3 year LLB (University of London) International degree 4. TMUC, 3 years LLB (University of London) <p>Students belonging to the affluent class in Karachi are also opting for LUMS – 5 year LLB program which is offering two degrees BA after two years and LLB after completing the program. Same model has been adopted by all 5 year LLB programmes in Karachi. Shaheed Zulfiqar Ali Bhutto University of Law, SM Law college, they are all offering two degrees in their 5 years programmes. Due to large number of LLB graduates coming into market from affiliated colleges and universities from all over Pakistan, it was decided by Pakistan Bar Council that they need to regulate this field of education in coordination with HEC.</p> <p>Most of the rules were changed by Pakistan Bar Council and new notification on legal education was issued which was to be applicable from Year 2015.</p>

	<ol style="list-style-type: none"> 1. It was decided that 3 years LLB will be discontinued from year 2018 2. Only 5 year LLB program will be offered by Universities 3. First 3 years must be offered in the morning program and for last 2 years evening timings can be used 4. No university will be allowed to take more than 100 students in one year 5. Class size should not be more than 35 students <p>PBC has recently issued notices to 7 Universities for not following their criteria, and these Universities have been stopped from advertising for new intake in Fall 2017. Universities include Quaid-i-Azam University, Islamia University of Bahawalpur, Karachi University, Federal Urdu University Islamabad and Karachi campus, Shah Abdul Latif Bhatai University, Shaheed Zulfiqar Ali Bhutto University, Bahauddin Zakriya University and Jamshoro University, Sindh.</p> <p>One of the conditions of Pakistan Bar Council is that it limits the University to impart legal education in its main campus only. All arrangements were made by BUKC to launch LLB programme in year 2014, it was stopped at the last moment on realization that under the permission granted to Bahria University by Pakistan Bar Council, a condition existed that Law department/ legal education was restricted to Islamabad campus only.</p> <p>It is extremely important that a fresh application should be submitted to Pakistan Bar council through its legal education committee for Karachi campus. It is recommended by our committee that Law Department should be initiated in BUKC after getting written approval from the Education Committee of Pakistan Bar Council.</p>
6	<p>Rationale for the Programme:</p> <p>Recent emerging trends in legal education because of lawyer's movement and Panama issue is resulting in attracting lot of young students towards this field. Legal education is fast evolving all over the world while in Pakistan law schools despite mushroom growth are lacking in quality and research. There is definitely a gap in legal education for a high quality institution which has the capacity to produce socially conscious professional lawyers. BUKC can capture this niche in the market.</p> <p>BUIC has already started LLB and LLM programs and have already produced 5 year LLB graduates and are receiving good response from the market from students seeking admission in LLB programme in Islamabad campus.</p> <p>We need preferably a retired judge to be the head of the department and balance of young and senior lawyers delivering courses of the LLB. Strong advertising campaign to highlight our strengths is also required</p> <ul style="list-style-type: none"> • Bahria University brand is stronger than most competitors • BUIC is already running this program successfully • Karachi campus infrastructure and security environment • 100 students per annum restriction by Pakistan Bar Council on educational institutions will open opportunities for new entrant like Bahria University Karachi campus • CPEC related legal opportunities
7	<p>Brief Description of the Programme:</p> <p>5 Years LLB program: based on HEC and Pakistan Bar Council requirements will be introduced in Karachi campus. This entire LLB will comprise of 10 semesters. Faculty will be inducted from retired judges, senior lawyers, and foreignqualified barristers to meet the quality standards. Our recommendation would be that we should also offer two degrees in our LLB (BA and LLB)</p>

	LLM: This programme will be initiated after three years of introduction of LLB as per the requirement of Bar Council
	Diplomas and Certificate Courses: We expect diplomas in income tax accounting and marine law Will become popular because of their huge demand with lawyers
8	Duration: 5 year LLB
9	Venue: Bahria University, Karachi Campus
10	Programme Scheduling Format: <ul style="list-style-type: none"> • First three years in the morning and last two years in the evening • Semester system
11	Proposed Date of Commencement: To be decided by the competent authority
12	Mode of Study/Examination: As per the policy of BU/ HEC
13	Additional Faculty Member(s) Required: Retired Supreme Court judge as HOD and one full time faculty member who has completed 5 year LLB and three visiting faculty members in the first semester and may be four to five visiting faculty members in the second semester Qualification: LLB/ LLM //JSD/PhD
14	Additional Skilled-Worker(s) Required: PA to HOD and one naib qasid
15	Additional Classroom(s) required: At least two class rooms for first year
16	Additional Requirement for Laboratories: 1 Mock court room
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: <ul style="list-style-type: none"> • According to Pakistan Bar Council requirement books worth not less than Rs. 5,00,000 should be acquired for the library • To acquire recognition from Pakistan Bar Council of our campus Rs. 15,00,000 fee has to be deposited with an application
18	Minimum Entry Level: Intermediate and A level
19	Admission Criteria: As per prevailing BU policy
20	Additional/Different Examination Requirement As per BU Policy
21	Number of Admissions Expected for First Intake: 10- 15
22	Number of Admissions Planned/Expected for Subsequent Intakes: 20-25 in the first three years and then 50 students for subsequent years
23	Referred by: Director's Directive No.31/2017 dated 1 August 2017
24	Complete Plan of Studies, inclusive of complete Roadmap: Road map is attached
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended)) As per BUCI

B. FINANCIAL DETAILS	
1	Source of Funding: • BU: Fully:
2	<u>Degree Duration: LLB</u> <u>Semester System and 5 Years</u> Semester: Number of Semester: 10

	Total Number of Credit Hours:166	
3	Expected fee to be charged based on Cost & Benefits Analysis: : rate per credit hour:	or Fee
4	Expected Number of students for 1st& 2nd Intakes: 15 and 20	
5	Expected Earning from first two Intakes (B5):	
6	Expected Earning for the Next Five Years (B6): (show working)	
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working)	
8	Cost of Additional Laboratory Equipment/Tools (B8): (show working)	
9	Cost of Additional Classrooms (B9): (Include furniture, technical aids etc)	
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details)	
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details)	
12	Miscellaneous Expenses required for Starting the Program (B12): <ul style="list-style-type: none"> - Advertisement: - Printing & Stationery - Admin Cost - Any other - Total: 	
13	Annual Recurring Expenditures in Subsequent Years (B13): <ul style="list-style-type: none"> - Salaries: - Rentals: - Subscriptions/Memberships: - Advertisements: - Printing & Stationery: - Admin Cost - Any other - Total: 	
14	Total Cost of the Programme (B14): [Add B(7) to B(12)]	
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)]	
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)]	
17	Projected Annual Gross Earning in Subsequent Years (B 17): (show details & working; add 10% towards all expenses in subsequent years.)	
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)]	

Appendix A**Projected Earnings for the First 2 Years:**

Semester	Students(minimum)			Fee per Student		Total Fee		
	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total
Spring 2018	15	0	15	104,000*	0	15,60,000	0	15,60,000
Fall 2018	15	15	30	104,000	73,000	15,60,000	10,95,000	26,55,000
Spring 2019	15	30	45	104,000	73,000	15,60,000	21,90,000	37,50,000
Fall 2019	15	45	60	104,000	73,000	15,60,000	32,85,000	48,45,000
Total Earnings								1,28,10,000

* Fees for the students of LLB according to fee structure of Fall 2017 with minimum class strength size

Two years projected earnings (with full fee): Rs. 1,28,10,000/=

Total Estimated Salaries for Regular Law faculty for first two years:

- A. 1 Head of Department @ Rs. 200,000/= per month : 48,00,000 (for 2 years)
- B. 1 permanent Faculty @ Rs. 100,000/= per month : 24,00,000 (for 2 years)
- C. Salary for visiting faculty:

Semester	Course	Salary @	Per semester Salaries
Spring 2018	3	1600x45=72,000	2,16,000
Fall 2018	6	1600x45=72,000	4,32,000
Spring 2019	12	1600x45=72,000	8,64,000
Fall 2019	18	1600x45=72,000	12,96,000
Total visiting's salary expenditure			28,08,000

A + B + C = Rs. 100,08,000/=

- A. Licence fee from Pakistan Bar Council : Rs. 15,00,000/=
- B. Cost of Law Books for the Library: Rs. 500,000/= Approx
- C. Advertising cost for the promotion: Rs. 500,000/= Approx
- D. Mock Court Room cost : Rs. 100,000/=
- E. Admin Cost: Rs. 840,000/ for two years (PA and naib qasid)
- F. Electricity cost : Rs. 12,00,000 for two years
- G. Stationary and petty expenses Rs. 2,00,000 for two years

Total cost for first 2 Years = Rs. 1,48,48,000/=

Saving = Earning – Cost = 1,28,10,000 – 1,48,48,000

Loss= Rs 20,38,000 (for first 2 years)

Projected Earnings for the First 5 Years: Appendix 2

Semester	Students(minimum)			Fee per Student		Total Fee		
	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total
Spring 2018	15	0	15	104,000	0	15,60,000	0	15,60,000
Fall 2018	15	15	30	104,000	73,000	15,60,000	10,95,000	26,55,000
Spring 2019	15	30	45	104,000	73,000	15,60,000	21,90,000	37,50,000
Fall 2019	15	45	60	104,000	73,000	15,60,000	32,85,000	48,45,000
Spring 2020	15	60	75	104,000	73,000	15,60,000	43,80,000	59,40,000
Fall 2020	15	75	90	104,000	73,000	15,60,000	54,75,000	70,35,000
Spring 2021	15	90	105	104,000	73,000	15,60,000	65,70,000	81,30,000
Fall 2021	15	105	120	104,000	73,000	15,60,000	76,65,000	92,25,000
Spring 2022	15	120	135	104,000	73,000	15,60,000	87,60,000	1,03,20,000
Fall 2022	15	135	150	104,000	73,000	15,60,000	98,55,000	1,14,15,000
Total Earnings							6,48,75,000	

* Fees for the students of LLB according to fee structure of Fall 2017 with minimum class strength size

Five years projected earnings (with full fee): Rs. 6,48,75,000/=

Total Estimated Salaries for Regular Law faculty for Five years:

- A. 1 Head of Department @ Rs. 200,000/= per month :1,20,00,000 (for 5 years)
- B. 1 Permanent Faculty @ Rs. 100,000/= per month : 60,00,000 (for 5 years)
- C. 2 Permanent Faculty @ Rs. 100,000/= per month : 72,00,000 (for 3 years)
- D. 2 Permanent Faculty @ Rs. 100,000/= per month : 48,00,000 (for 2 years)

A + B + C + D = Rs. 3,00,00,000/=

E. Salary for visiting faculty:

S. No	Semester	Course	Salary @	Per semester Salaries
1	Spring 2018	3	1600x45=72,000	2,16,000
2	Fall 2018	6	1600x45=72,000	4,32,000
3	Spring 2019	12	1600x45=72,000	8,64,000
4	Fall 2019	18	1600x45=72,000	12,96,000
5	Spring 2020	16	1600x45=72,000	11,52,000
6	Fall 2020	22	1600x45=72,000	15,84,000
7	Spring 2021	18	1600x45=72,000	12,96,000
8	Fall 2021	22	1600x45=72,000	15,84,000
9	Spring 2022	27	1600x45=72,000	19,44,000
10	Fall 2022	32	1600x45=72,000	23,04,000
Total visiting's salary expenditure				1,26,62,000

$$A + B + C + D + E = 4,26,62,000$$

- F. Licence fee from Pakistan Bar Council : Rs. 15,00,000/=
- G. Cost of Law Books for the Library: Rs. 800,000/= Approx
- H. Subscription of Law Journals: Rs. 2,00,000/= Approx
- I. Advertising cost for the promotion: Rs. 10,00,000/= Approx
- J. Mock Court Room cost : Rs. 100,000/=
- K. Admin & miscellaneous Cost: Rs. 21,00,000/= Approx for 5 years
- L. Electricity bill for 5 years Rs. 48,00,000
- M. Stationary and miscellanies expenses Rs. 5,00,000

Total cost for first 5 Years = Rs. 5,36,62,000/=

$$\text{Saving} = \text{Earning} - \text{Cost} = 6,48,75,000 - 5,36,62,000$$

$$\text{Saving} = 1,12,13,000^*$$

*(when fee and salaries remains constant)

Road Map for 5 years LLB program

CURRICULUM OVERVIEW-

S.No	Courses	Number of Courses	Credit Hours
1	Compulsory	10	28
2	General and Foundation	08	24
3	Discipline Specific Major Courses including Research / Internship	38	114
	TOTAL	56	166

Road Map

Semester 1

Course Code	Course Description	Credit Hours
LLB-111	ENGLISH-I	3
LLB-112	PAKISTAN Studies	2
LLB-113	SOCIOLOGY	3
LLB-114	FUNDAMENTALS OF ECONOMICS	3
LLB-115	INTRODUCTION TO LAW	3
LLB-116	SKILLS DEVELOPMENT-I	3
	TOTAL	17

Semester 2

Course Code	Course Description	Credit Hours
LLB-121	ENGLISH –II	3
LLB-122	ISLAMIC STUDIES/ETHICS	2
LLB-123	POLITICAL SCIENCE	3
LLB-124	LEGAL SYSTEM OF PAKISTAN	3
LLB-125	HISTORY (South-Asia)	3
LLB-126	SKILLS DEVELOPMENT-II	3
	TOTAL	17

Semester 3

Course Code	Course Description	Credit Hours
LLB-211	ENGLISH-III	3
LLB-212	LOGIC AND REASONING	3
LLB-213	ISLAMIC JURISPRUDENCE-I	3
LLB-214	LAW OF TORTS	3
LLB-215	LAW OF CONTRACT-I	3
LLB-216	RESEARCH METHODS	3
	TOTAL	18

Semester 4

Course Code	Course Description	Credit Hours
LLB-222	HUMAN RIGHTS LAW	3
LLB-223	CONSTITUTIONAL LAW-I (COMPARATIVE)	3
LLB-224	LAW OF CONTRACT-II	3
LLB-225	ISLAMIC JURISPRUDENCE-II	3
LLB-226	COMPARATIVE RELIGIONS	3
	TOTAL	15

Semester 5

Course Code	Course Description	Credit Hours
LLB-311	JURISPRUDENCE-I	3
LLB-312	CONSTITUTIONAL LAW-II (PAKISTAN)	3
LLB-313	ISLAMIC PERSONAL LAW-I	3
LLB-314	CRIMINAL LAW-I	3
LLB-315	LAW OF PROPERTY-I	3
	TOTAL	15

Semester 6

Course Code	Course Description	Credit Hours
LLB-321	JURISPRUDENCE-II	3
LLB-322	CORPORATE LAW	3
LLB-323	ISLAMIC PERSONAL LAW-II	3
LLB-324	CRIMINAL LAW-II	3
LLB-325	LAW OF PROPERTY-II	3
	TOTAL	15

Semester 7

Course Code	Course Description	Credit Hours
LLB-411	PUBLIC INTERNATIONAL LAW-I	3
LLB-412	CONSTITUTIONAL HISTORY OF PAKISTAN	3
LLB-413	CIVIL PROCEDURE-I	3
LLB-414	CRIMINAL PROCEDURE-I	3
LLB-415	LAW OF EVIDENCE-I	3
LLB-416	LEGAL DRAFTING-I	3

	TOTAL	18
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Semester 8

Couse Code	Course Description	Credit Hours
LLB-421	PUBLIC INTERNATIONAL LAW-II	3
LLB-422	EQUITY AND SPECIFIC RELIEF	3
LLB-423	CIVIL PROCEDURE-II	3
LLB-424	CRIMINAL PROCEDURE-II	3
LLB-425	LAW OF EVIDENCE-II	3
LLB-426	LEGAL DRAFTING-II	3
	TOTAL	18

Semester 9

Course Code	Course Description	Credit Hours
LLB-511	ADMINISTRATIVE LAW-I	3
LLB-512	LEGAL ETHICS	3
LLB-513	ELECTIVE-I	3
LLB-514	ELECTIVE-II	3
LLB-515	MOOT CASES AND ROLE PLAYING	3
	TOTAL	15

Semester 10

Course Code	Course Description	Credit Hours
LLB-521	ADMINISTRATIVE LAW-II	3
LLB-522	INTERPRETATION OF STATUTES	3
LLB-523	RESEARCH PROJECT	3
LLB-524	ELECTIVE-III	3
LLB-525	ELECTIVE-IV	3
	TOTAL	15

Elective Courses

- Alternate Dispute Resolution
- Banking Laws
- Conflict of Laws
- Consumer Protection Laws
- Custom and Tariff Laws
- e-Commerce Law
- Election Laws
- Environmental Laws
- Gender and Law
- Insurance laws
- Intellectual Property Laws
- International Economic Law
- International Humanitarian Law
- International Institutions
- International Trade Law
- Islamic Commercial Laws
- Labour Laws
- Land Laws
- Law and Development
- Law and Energy
- Local and Special Laws
- Media Laws

- Mergers and Acquisitions
- Minor Acts
- Islamic Legal Maxims
- Public Interest Litigation
- Securities Regulation
- Shipping and Admiralty Laws
- Taxation Laws
- Telecommunication Laws

Internship

After completion of 8th Semester during vacations (3 Credit Hours)

Structure of LUMS –BA- LLB

Graduation Requirement	162 credit hours		
1.	B.A.	Total	62 credit hours
		University Core	8 credit hours [3 courses]
		University Distribution:	12-16 credit hours [4 courses]
		In-Group	
		Out-Group	9-12 credit hours [3 courses]
		Pre-Law Core	9 credit hours [3 courses]
		Free Electives*	17-24 credit hours
2.	LL.B	Total	100 credit hours [27 courses]
		Major Cores	81 credit hours [22 courses]
		Major Electives	19-20 credit hours [5 courses]

* courses needed to complete the Free Elective requirement will depend on the credit hours of the courses taken, which vary from 3 to 4 credits.

The core courses listed below are required of all students.

1. Contract Law [Law 220]
2. Criminal Law [Law 240]
3. Torts Law [Law 222]
4. Concept of Law [Law 210]
5. Constitution (Comparative) Law [Law 230]
6. Commercial Law [Law 223]
7. Islamic Jurisprudence [Law 260]
8. Property Law [Law 224]
9. Legal Writing and Research Methods [Law 280]
10. Jurisprudence [Law 310]
11. Public International Law [Law 352]
12. Muslim Personal Law [Law 360]
13. Constitution and Administrative Law [Law 331]
14. Equity, Specific Relief and Trusts [Law 320]
15. Human Rights Law [Law 353]
16. Labour Law [Law 322]
17. Civil Procedure [Law 471]
18. Evidence [Law 470]
19. Legal Practice I [Law 481A]
20. Criminal Procedure [Law 472]
21. Moot Court [Law 482]
22. Legal Practice II [Law 481B]

Annex 2

The details of the requirements are provided hereunder;

1. Higher Education Commission

1.1. For establishing the law department at Karachi Campus firstly a No-Objection Certificate is required from Higher Education Commission (hereinafter 'HEC') in accordance with notification no. NOC/GEN/2016. HEC has also set standard of curriculum as already adapted by the Bahria University, Department of Law, Islamabad. (Please see **Annex 'A'** for Curriculum).

2. Pakistan Bar Council

2.1. The Second requirement is from the Pakistan Bar Council (hereinafter 'PBC') as the Pakistan Bar Council is empowered through the Sections 13(j) & (k), 26(c) (iii) and 55(q) of the Legal Practitioners & Bar Councils Act, 1973 to make rules and regulation for the universities or the institutes imparting legal education.

2.2. The Pakistan Bar Council Legal Education Rules, 2015 (hereinafter 'the Rules') clearly indicates that to start a new program of LLB there shall be another recognition process. (Please see **Annexure 'B'**for Rules)

2.3. The application according to prescribed proforma (as Annexed as **Annexure 'C'**) should be filled and submitted along with the fee of PKR: 15,00,000/- (1.5 Million).

2.4. The Applicant University (as in this case the Bahria University) shall have to submit an undertaking in writing on a stamp Paper of Rs. 100/-, duly notarized, to the effect that it shall:-

(i) not affiliate any private law college at any place, nor itself conduct law classes anywhere else except of its main campus.

(iii) abide by and adhere to the minimum standards as laid down in these Rules and instructions/directions issued by the Pakistan Bar Council from time to time in respect of legal education, the violation of which will render the University/Institution to be derecognized;

(iv) ensure imparting of quality education strictly in accordance with the syllabus prescribed by the Pakistan Bar Council and the Higher Education Commission; and

(v) ensure conducting and adhering only to 5 years composite programme of LL.B. as per standards and criteria prescribed by the Pakistan Bar Council and Higher Education Commission.

2.5. There is a requirement of separate library at Department of Law with 5000 standard law books covering all the statutes, Federal and Provincial. The worth of books shall not be less than PKR: 500,000/- (Five Hundred Thousand) and should spend PKR: 80,000 (Eighty thousand) per annum at library.

2.6. Following is criteria of providing admissions in LLB Program:

Higher Secondary School Education i.e. Intermediate, shall be eligible for admission to 1st year of (5 years) LL.B. programme.

5 percent seats shall be reserved for the sons/daughters of Advocates who shall compete for admission in order of merit *inter se*.

2.7. A Section of a Class in a Faculty of Law/Law Department/ Law College shall not be of more than 35 students and the total number of students admitted in 1st year LL.B. in any case shall not accede 100.

2.8. Semester system examinations should be followed, as followed by Department of Law, Bahria University, Islamabad Campus.

2.9. There are no specified instructions for building of the University Department of Law, as far as generally Universities are built and verified through HEC standards. Though the Rules implies standards building structures for affiliated law colleges.

Appendage 3026

**Launch Proposal PHD in International Relations
Department of Humanities and Social Sciences, BUIC**

Introduction

The department of Humanities and Social Sciences has successfully launched Masters of Science (MS) in International Relations in Spring 2017. Keeping in view the demands of market and faculty resources at the Department, the DBOS has decided to launch PhD in International Relations w.e.f. Spring 2018. HEC requires 3 full time PhD faculty members in the relevant disciplines to launch a PhD program. HSS Department presently has three permanent PhD FMs, which fulfills the HEC/ BU requirement.

Objective

The objective of PhD program in IR is to contribute in bringing forward a new generation of scholars equipped with profound knowledge of discipline with an ability to advance scholarship in areas of their specialization. The vibrant research oriented environment assists students to generate a new knowledge in the field, critically analyze academic research and apply existing experience to add to the policy oriented research. The Department has particular strength in Political Theory, International Relations Theory, International Political Economy, World Affairs, Peace and conflict, and Security Studies. The regional studies of Central Asia, Middle East, Northeast and Southeast Asia also enrich the cluster of scholarship as the mode of research. The Department aims at providing a vibrant research environment for PhD students by including multiple areas of foreign policy analysis, nationalism, political history, regional and international environment.

The degree consists of teaching curriculum and research; the course work is followed by writing of a thesis. The teaching curriculum is a blend of theoretical, substantive and methodological streams to polish students' research skills; deepen student's knowledge of the discipline and to strengthen students' skills as academic practitioners. The research environment is aimed at proficiency in terms of originality, significance and rigor.

Eligibility Criteria

1. A PhD candidate must have completed 18 years of education in any of the following subjects with a minimum CGPA of 3.0 out of 4.0 (semester system) or 60% (First Division) in annual system. The subjects include:
 - a. International Relations
 - b. Political Science
 - c. Defense and Strategic Studies
 - d. Defense and Diplomatic Studies
 - e. Peace and Conflict Studies
 - f. Government and Public policy
 - g. Area Studies
 - h. Development Studies
 - i. Political History
 - j. Media Studies
 - k. Pakistan Studies
2. NTS-GAT (Subject Test), or GRE (Subject Test) passed with minimum 60% marks or BU Admission Test with 70% Marks.
3. A sound and comprehensive but tentative research proposal must be submitted along with the admission form.
4. PhD candidate will appear before Departmental PhD Committee for interview. Decision of PhD Committee regarding scholar's admission shall be final.

Program Requirements

1. PhD scholar must complete 18 credit hours of course work during the first two semesters. However, in case of failure/drop or in other cases where scholar cannot pass course work during the first two semesters, s/he will be eligible to complete the same in the third semester.
2. If scholar fails the same compulsory subject twice s/he will not be allowed to continue his/her program. University will not refund any of the dues except security fee in this case.
3. Departmental comprehensive exam will be conducted within the second year of degree. Relaxation of time may be given to special cases subject to departmental PhD Studies Committee.
4. Departmental PhD Studies Committee will comprise of all PhD faculty members and decisions of the Committee will be acceptable with a simple majority.
5. A total of 36 credit hours to be completed for dissertation by the scholar.
6. The scholar will submit Dissertation to the Department after the Supervisor's consent.
7. Scholar will give TWO presentations on his/her topic before final submission to the Department. During these presentations faculty will evaluate quality of the thesis and can give suggestions/recommendations which the scholar will incorporate into his/her thesis but such changes are subject to Supervisor's consent.
8. The course work shall be completed with minimum CGPA of 3.0/4.0.
9. Scholar will follow Chicago Manual for thesis writing.
10. Upon successful submission of the thesis, same is sent to THREE foreign experts for evaluation. TWO positive reports are mandatory for the conduct of final defense. In case two of the foreign evaluators do not give positive reports a new panel will be formulated and out of that two new evaluators will be selected.
11. At least ONE HEC recognized publication is mandatory (relevant to the thesis topic) for final submission of the thesis. Acceptance from HEC recognized journal is also acceptable.
12. There will be a public defense in the viva-voce examination for the award of degree.

Programme Contents

1. Course Work (18 Credit hours)
2. Comprehensive Exam.
3. Dissertation (36 credit hours)
4. Final Defense.
5. The course work shall be completed with minimum CGPA of 3.0/4.0.

Scheme of Study

S. No	Course	Semester	Status	Credit Hours
1	Compulsory-I	1 st	Compulsory	3
2	Compulsory-II	1 st	Compulsory	3
3	Optional I	1 st	Elective	3
4	Optional II	2 nd	Elective	3
5	Optional III	2 nd	Elective	3
6	Optional IV	2 nd	Elective	3

List of Compulsory Courses

Course Code	Course Title	Credit Hours
IRS-701	Advanced Course on Theories of International Relations	3
IRS-702	Advanced Course on Research Methodology	3

List of Electives

Course Code	Course Title	Credit Hours
IRS-721	Theories of Comparative Politics	3
IRS-722	Seminar on Selected Contemporary Issues in International Politics	3

IRS-723	South Asia in Global Politics	3
IRS-724	Middle East in Global Politics	3
IRS-725	South East Asia in Global Politics	3
IRS-726	Central Asia in Global Politics	3
IRS-727	Latin America in Global Politics	3
IRS-728	Africa in Global Politics	3
IRS-729	Contemporary Muslim World	3
IRS-730	Comparative Study of Foreign Policies of Major Powers	3
IRS-731	Politics and Foreign Policy of USA	3
IRS-732	Politics and Foreign Policy of China	3
IRS-733	Politics and Foreign Policy of Russia	3
IRS-734	International Law and Organization	3
IRS-735	Regionalism: Theory and Practice	3
IRS-736	International Political Economy	3
IRS-737	Advanced Strategic Studies	3
IRS-738	Nuclear Studies	3
IRS-739	Contemporary Conflict Resolution	3
IRS-740	Media and International Relations	3
IRS-741	Contemporary Critical Debates in International Relations	3
IRS-742	Issues in Pakistan's Foreign Policy: Seminar Course	3
IRS-743	International Environmental Politics	3
IRS-744	Globalization, Modern State And Society	3
IRS-745	Dynamics of Security in International Relations	3
IRS-746	Dynamics of Modern Diplomacy	3
IRS-747	Climate Change, Sustainable Development & International Security	3
IRS-748	Refugees and Forced Migrants in International Relations	3
IRS-749	Politics of the Indian Ocean	3
IRS-703	Advanced Course on Foreign Policy Analysis	3

**NEW PROGRAMME PROPOSAL
for
PhD in International Relations**

A. ACADEMIC DETAILS	
1	Faculty/Department: Department of Humanities and Social Sciences, Bahria University, Islamabad Campus (BUIC)
2	Name of the Programme: Doctor of Philosophy (PhD) in International Relations
3	Mission of the Programme: To equip the scholars with relevant tools and skills to undertake academic research and teaching in the field of International Relations.
4	Objectives of the Programme: The objective of PhD program in IR is to contribute in bringing forward a new generation of scholars equipped with profound knowledge of discipline with an ability to advance scholarship in areas of their specialization. The vibrant research oriented environment assists students to generate a new knowledge in the field, critically analyze academic research and apply existing experience to add to the policy oriented research. The Department has particular strength in Political Theory, International Relations Theory, International Political Economy, World Affairs, Peace and Conflict, and Security Studies. The regional studies of Central Asia, Middle East, Northeast and Southeast Asia also enrich the

	cluster of scholarship as the mode of research. The Department aims at providing a vibrant research environment for PhD students by including multiple areas of foreign policy analysis, nationalism, and political history, regional and international environment.
5	<p>Outcomes of the Programme:</p> <p>Skills to identify and solve problems in their professional settings.</p> <p>Training to effectively articulate, communicate and advocate their view point.</p> <p>Ability to produce professional research work and to critically evaluate research work of others.</p> <p>To pursue a professional and successful career in their field of specialization.</p>
6	<p>Rationale for the Programme:</p> <p>PhD (IR) will add diversity to the programs being conducted at Islamabad Campus of Bahria University.</p> <p>Islamabad is the hub of academic discipline of IR and related fields. However, only limited number of universities offers admissions in PhD program with limited number of seats. Department expects a good intake into the program. Similarly, H&SS Department has successfully launched MS (IR) program. So, it's the requirement of time to start the program. It would not only be a successful program itself but would also boost the undergrad and MS (IR) as well.</p> <p>The department has THREE PhD PFMs in the field which fulfills the HEC/BU requirements to start a new PHD program.</p>
7	<p>Brief Description of the Programme:</p> <p>Department of HSS is offering a 3 years PhD degree in International Relations. The programme is designed to satisfy diverse needs and interests of the scholars. The students will be offered course work worth 18 credit hours followed by a dissertation worth 36 credit hours.</p>
8	Duration: Minimum 3 Years (6 Semesters)
9	<p>Venue(s): On Site/Off Site/Both On & Off Site (<i>Tick one; if Off Site, give details</i>)</p> <p>Department of Humanities and Social Sciences, Bahria University, Islamabad Campus, Shangrilla Road Islamabad.</p>
10	Programme Scheduling Format: Evening Bi-Semester
11	Proposed Date of Commencement: Spring 2018
12	Mode of Study/Examination: Semester System
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) 2 PhD
14	Additional Skilled-Worker(s) Required: (<i>Indicate if there is a requirement for additional Skilled Staff, fulltime/part-time, along with their qualifications/skill sets.</i>) Nil
15	Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) Nil
16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) Nil
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Nil
18	<p>Minimum Entry Level:</p> <p>18 years of education from HEC recognized educational universities / institutes, students with background of;</p> <ul style="list-style-type: none"> a. International Relations b. Political Science c. Defense and Strategic Studies d. Defense and Diplomatic Studies e. Peace and Conflict Studies

	f. Government and Public policy g. Pakistan Studies h. Area Studies i. Development Studies j. Media Studies k. History
19	Admission Criteria: As per HEC/BU Policy
20	Additional/Different Examination Requirement <i>(Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue).</i> As per BU Policy
21	Number of Admissions Expected for First Intake: 5-8 students
22	Number of Admissions Planned/Expected for Subsequent Intakes: 20 % increase every semester
23	Referred by: (delete which is inapplicable) FBOS: 14 th FBOS (Item 1409) held on 15 th August 2017
24	Complete Plan of Studies, inclusive of complete Roadmap: (Attach as Annex 'A') Attached
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (Attach as Annex 'B') Attached

B. FINANCIAL DETAILS		
1	Source of Funding: BU: Fully	
2	Degree Duration: Semester: Minimum 6 semesters (3 years) Total Number of Credit Hours: 54	Annual or Semester System:
3	Expected fee to be charged based on Cost & Benefits Analysis: (show working) Fee rate per credit hour: Rs. 5,500	
4	Expected Number of students for 1st & 2nd Intakes: 5-8 students	
5	Expected Earning from first two Intakes (B5): (Show working) $87,500 \times 5 \text{ (1}^{\text{st}} \text{ intake)} + 87,500 \times 6 \text{ (2}^{\text{nd}} \text{ intake)} = 437,500 + 525,000 = 0.96 \text{ Million}$	
6	Expected Earnings for the Next Five Years (B6): (show working) $1,234,500 + 2,718,000 + 4,364,500 + 6,229,000 + 7,963,000 = 22.5 \text{ Million}$	
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working) Salary of 2 PhD = 0.3 million x 12 = 3.6 million/annum	
8	Cost of Additional Laboratory Equipment/Tools (B8): (show working)	Nil
9	Cost of Additional Classrooms (B9): (Include furniture, technical aids etc)	Nil
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details)	0.2 Million/annum
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details)	Nil
12	Miscellaneous Expenses required for Starting the Program (B12):	<ul style="list-style-type: none"> - Advertisement: - Printing & Stationery: - Admin Cost: - Any other Total: 0.2 million
13	Annual Recurring Expenditures in Subsequent Years (B13):	<ul style="list-style-type: none"> - Salaries:

	<ul style="list-style-type: none"> - Rentals: - Subscriptions/Memberships: - Advertisements: - Printing & Stationery: - Admin Cost <p>Any other - Total: 1.8 million</p>
14	Total Cost of the Programme (B14): [Add B(7) to B(12)] $B(7) + B(12) = 3.6 \text{ million} + 0.2 \text{ million} = 3.8 \text{ Million}$
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] $B(14) - B(1) = 3.8 \text{ Million} - 0 = 3.8 \text{ Million}$
16	Net Earnings in First Year (B16): [Subtract B(15) from B(5)] $B(5) - B(15) = 0.96 \text{ million} - 3.8 \text{ million} = -2.84 \text{ Million}$
17	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>) 1.5 Million (incremental)
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] $B(17) - B(13) = 1.5 \text{ million} - 1.8 \text{ million} = -0.3 \text{ Million}$

Appendage 3027

Policy for Dropping (Withdrawal) from Course Three Weeks Before Final Examination

Background:

As per student handbook, presently the student is allowed to drop a course by second week of start of semester with full/half fee adjustment. In terms of the above, a student is not allowed to withdraw from a course after 7 weeks. In other words, a student cannot withdraw from a course after mid-term exam. In case a student does not obtain a satisfactory score in the mid-term exam, he/she has to continue with the semester. Allowing student to drop the course till 13th week will facilitate students making sound decisions for continuing or withdrawing the course. This will also reduce the drop rate. The point was discussed in detail. Most of the participants agreed that allowing students to drop the course by 13 week would facilitate student making sound decisions for continuing or withdrawing the course.

HR Implications: Nil.

Financial Implications: Nil.

Discussion

The point was discussed in combined meeting of FBOS of all campuses of Bahria University. Various clarifications were sought by the members which were responded by the HOD-MS. Members agreed the view point of the sponsors and finally the point was recommended for ACM's approval.

Conclusion:

There is a consensus that students at the bachelors levels may be allowed to withdraw/drop course/s till 13th sessions instead 7th session of the semester.

Recommendations:

Hence, it is recommended that the agenda item may be approved by the worthy house.

Appendage 3028

Submission of Final Result

Time for submitting final result has been prescribed as 3 days after conduct of the examination. Few participants argued that given the situation while most of the FMs are busy in invigilation till the final day, this is considered a bit difficult and unrealistic. This is probably forced to ensure announcing of result on a specific day through website. Results are entered by FMs and the IT department only needs to release it through the system. This activity does not require much effort as compared to assessing the answer sheets. Few participants argued that assessing answer sheet is a serious matter and cannot be left to robotic action. Therefore there is a need to be allowed more time for paper assessment to the faculty members so that justice may be done with the paper evaluation. Allowing more times may also be saving time after the submissions by reducing number of errors on the part of examiners might have been committed due to insufficient time given.

HR Implications: Nil.

Financial Implications: Nil.

Discussion

Without much discussion, the point was principally approved as recommended by the HOD-MS (KC). However Dean asked for specific recommended duration for submitting the papers. Some participants suggested that keeping into account all ifs and buts, time must be calculated on the basis of assessing @ 20 copies / working day. This could ensure error free results along with degree of satisfaction amongst all concerned.. HOD MS BUKC suggested it be one week after the last examination day.

Recommendation(s) to the Academic Council

Hence, it is recommended that the agenda item may be approved by the worthy house.

Appendage 3029

MBA 1.5 years Admission Eligibility

Currently, Bahria University is offering admission to MBA 1.5 year program to those candidates who have completed their 4-year BBA programs. However, as per new HEC rules, candidates having ACCA, CA, ACMA, BCom (4 Years), MCom, MPA are also eligible to get admission into MBA 1.5 Year program. The house agreed that admission policy should be modified to allow admission of candidates having above-mentioned qualifications into MBA 1.5 year program.

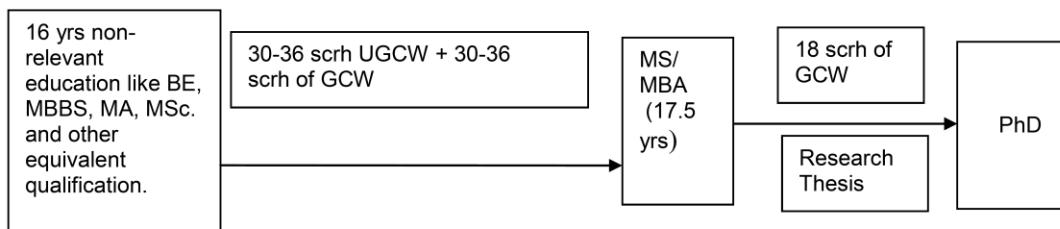
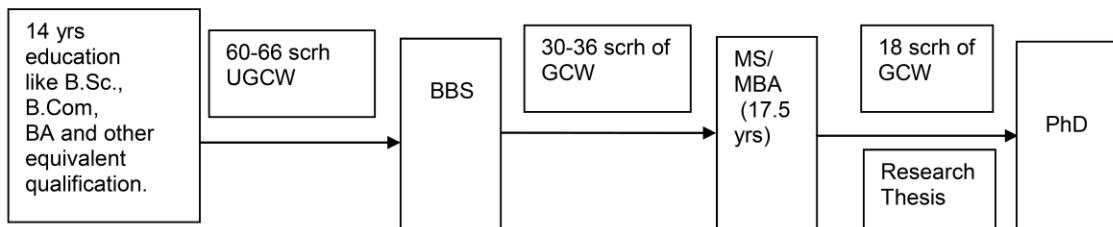
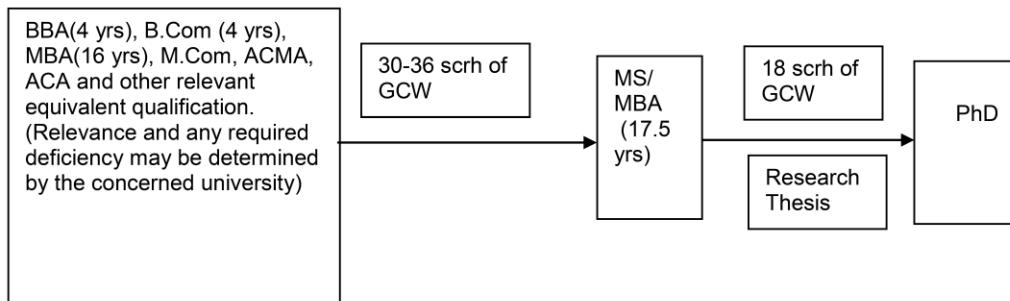
Discussion

The main point which came under discussion was of relevant and non-relevant education. HOD-MS responded to the questions of relevant education by saying that ACMA, ACCA and other professional degrees of 16 years education are given admission in MS program. Therefore, such degrees holders become entitle of getting admission in MBA as MBA of 18 years education is equal to MS degree. Dean opined that business administration, public administration and commerce fall under the preview of management sciences. House recommended that the point may be taken to the ACM for discussion and approval.

Recommendation

Hence, it is recommended that the agenda item may be approved by the worthy house.

Roadmap for Business Education



Semester Credit Hour-----scrh
Undergraduate Coursework-----UGCW
Graduate Coursework-----GCW

Notes:

30-36 Graduate Coursework for MS/MBA includes compulsory 6 credit hours of research thesis in case of MS and research/project in case of MBA. (A consensus was reached in previous meetings that research thesis is compulsory for MS and can't be substituted with two courses. In case of MBA the project may be substituted with two courses.

Appendage 3030**Subject: Extension of BS Thesis timeframe in accordance with MS Thesis Timeframe****1. Background to the Case**

According to Bahria University Academic Rules 2016 (BU Academic Rules, Sec 3.9) for all BS programs, Theses are to be registered according to regular road map and the target date for completing shall be allotted by the respective departments (Sec 3.9.1.1). Students unable to complete the thesis requirement of time shall be required to register again (Sec 3.9.1.2). A student shall be eligible for an Academic Honour if the student has completed the program within the regular program duration (Sec 9.2.1.1).

The agenda item was placed before DBOS meeting for discussion that the BS Thesis of the students of Department of Earth and Environmental Sciences is very difficult to be completed within 8th semester as it requires more time because the data has to be issued by the Directorate General of Petroleum Concession, Pakistan (DGPC) after which the students work on their thesis. All the members of DBOS agreed that the same timeframe which is given to MS students should also be approved for the BS program s. MS students are given 10 weeks of the next semester after the completion of their regular degree duration (MS/MPhil Rules 2016, Sec 14.6), same should be given to BS students.

2. Recommendations FBoS forwarded the case to ACM for further consideration.**TRANSCRIPT OF PRESENTATION BY HOD EES BUIC****Slide-1****Extension of BS Thesis timeframe at par with MS Thesis timeframe****Slide-2**

1. The case has been recommended in DBOS on 4th July 2017.
2. The case was later discussed in 13th FBOS meeting held on 10th August 2017.
3. The case is being presented in the 30th ACM for approval.

Slide-3**Background of the Case**

1. Theses are compulsory in all the programs of E&ES department. For Honours and awards at MS level, the students shall have to submit the thesis by the end of week-10 into the next semester after the final semester. The students completing their theses within this time period shall be eligible for Honours and Awards. The regular time duration for MS degree completion is 2 years.
2. At BS level, for Honors and Awards, results submission are compulsory in the 8th Semester (Regular time duration). However, due to unavoidable circumstances, it is very hard for the students to produce quality theses and submit their theses within the timeframe. The main reason is difficulty in data collection, field and analytical works. From 2014 to 2016, at BS and MS levels, 213 students are enrolled for theses.

Recommendation To facilitate the BS students for their Honours and Awards, it is recommended to grant approval for 10 weeks of the next semester after the completion of their regular degree duration at par with the MS programs.

Appendage 3031

Amendments to ‘BU Academic Regulations’ and ‘BU Academic Rules’ in the light of HERC Decisions

In its 21st meeting, the HERC approved the revised MS/Phil Rules which necessitate minor amendments to few clauses of the ‘BU Academic Regulations’ and ‘BU Academic Rules’, as follows:

a. BU Academic Regulation clause 2.2.2.c.

“process approval of course exemptions at the PhD level, PhD synopses, research proposals and research grants”

This TOR of HERC has been transferred to the FRC; so it needs to be deleted from here.

b. BU Academic Rule clause 2.2.1.

“Migration will only be allowed if CGPA of the applicant is above the following minima according to the grading system of BU”.

The CGPA is the CGPA at the time of migration to BU. So, the text *“(at the time of migration to BU)”* needs to be inserted after “CGPA”.

c. BU Academic Rule clause 2.2.4

“....and a minimum of C+ grade according to the BU grading system....”

For PG programmes, the minima has been changed to B grade. Therefore, the text *“(B grade for PG programmes)”* needs to be inserted after “C+ grade”.

Appendage 3032

Approval of Conduct of Separate Examination for FMDC & BUMDC

Background of the Case:

The current curriculum and TOS approved by the ACM is the same for BUMDC and affiliated colleges. However the teaching methodology is slightly different. BUMDC is following Hybrid Modular System but the other colleges including Frontier Medical and Dental College are still teaching according to the annual system.

The colleges on hybrid modular system are approved by ACM for 20% Internal Assessment but others on annual system will remain on 10% internal assessment till they change to modular system.

- a. The annual and supplementary examination papers should be the same for each subject of all the Medical and Dental Colleges, and results to be prepared accordingly.
- b. The result weightage may be adjusted as follows:
 - (i). The results of colleges on Hybrid system may be converted to 80% (with 20% internal assessment) in the final results.
 - (ii). The results of colleges on Annual system may be converted to 90% (with 10% internal assessment) in the final results.

Or

- c. As a second option; separate papers may be made for each subject for each college.

Both BUMDC and FMDC agreed to para-2 above. After discussion it was decided that the case to be put up to next ACM for its approval.

Financial Effects:

BU to save the finances in case of single paper.

Recommendations:

Recommended.

Establishment / HR effect any:

Nil

Appendage 3033

Title of Humanities & Natural Sciences (H&NS) Department, BUKC to be changed into Humanities & Social Sciences (H&SS)

Background:

Humanities & Natural Sciences (H&NS) Department of BUKC to be turned into Humanities & Social Sciences (HSS) Department:

The Department of Humanities & Natural Sciences (H&NS) was formed in 2013, having a great vision and aim to start a degree program. Due to some reasons, it could not proceed the way it should have been. Nevertheless, it now re-emerges and all set to start afresh. With reference to the 14th FBOS, held on Friday, 15th August, 2017, it was approved the FBOS Agenda Item 1429 to be recommended that title of the department should be change to Humanities & Social Sciences H&SS to make same title with already functioning at BUIC.

HR Implications: Nil

Discussion: Without much discussion in FBOS the Agenda Point approved for next ACM.

Decision Agenda Item 1429: The FBOS Agenda Item 1429 to be recommended to forward for upcoming 29th ACM for Approval.

Appendage 3036**Departmental Budget for Students' participation in National Competitions / Exhibitions / Conferences / Workshops / Seminars****2. Background to the Case**

The students in Bahria Many students are encouraged to participate in Competitions/Exhibitions/Conferences/Seminars/Workshops to attend. These competitions at national level have preliminary scrutiny and the final decisions of participation or otherwise are made close to the deadline.

On the other hand, invitations for certain workshops, seminars or exhibitions are received at the department at the eleventh hour.

In most of such cases, the events have registration / participation fee of the event. The departments move the case on files and then wait for the approval. BU management has always welcomed such initiative and the cases are approved. However once the deadlines are very close, it's always hard to convince the students to first register and then apply for reimbursement. Moreover the students get discouraged by such scenarios. The departments themselves don't have any budget provision. e.g. In April-2017, one of our FYP students won the first prize at Microsoft Imagine Cup National Finals, held at Islamabad. They traveled to participate at the competition at their own travel expenses. However, they claimed reimbursement of their travels from the campus after winning finals. In fact, there is no such allocation of payments for the above said at the departmental, faculty or campus level. In other instance, one of FYP groups travelled to Islamabad at their own expenses. In short, many students are unwilling to participate in conferences, workshops, seminars and competitions due to travel, registration fee and living cost at the national level.

3. Financial Effect PKR 200,000 per department per annum**4. Recommendations**

FBoS recommended the following:

- The departments be allocated PKR 200,000 per annum for student technical events including workshops, conferences, exhibitions, competitions at university / national level.
- Head of Department will be responsible for the fund utilization, and the funds will be spent as per BU rules.
- End of year (fiscal) report as per BU rules along with receipts would be submitted in the campus.
- The decision of participation in an event will be taken by departmental committee constituted by Dean.

Appendage 3037**Removal of all References to 'F' Grades & Repeated Courses from the Final Transcript****Background**

1. During deliberation on the Academic Council Item 2901, on 14 Sep 2017, it was proposed by some members of the Academic Council to delete all negative references from the student's Final Transcript – mentions of 'F' Grade and Repeat (R) courses. This was to safeguard the job prospects of the BU graduates, and to ensure that they are not harmed doubly having already suffered through late graduation and payment of additional fees. Upon which, DAcad, DE and Dean ES were asked to deliberate on the issue.

Analysis & Discussion

2. The problem highlighted is considered genuine. Placement of graduates is important for any alma mater and any impediments coming in that way need to be pre-removed.

3. The proposal has technical implications. If 'F' and 'R' references are removed, the semester GPA and the running CGPA would become erratic. This would imply that these too would have to be removed and replaced by the end-of-the-programme CGPA only, displayed prominently on the transcript. This leads to another issue - the University would lose track of student's semester-wise performance. To address that, there would need to be two Final Transcripts – one in the current shape for the University records, and two for the student which would have no reference to F grades or Repeat courses. So, the solution would be:

- a. No change to the Interim Transcript.
 - b. 2 Final Transcripts: University's and Student's.
4. This solution would warrant software changes in the University's ERP.
5. Universities in Pakistan are practising different models:

<u>Model</u>	<u>Examples</u>
A All 'F' and 'R' courses transcribed	BU, NUST, LUMS, COMSAT etc
B No mention of 'F' or 'R' but number of attempts indicated against each course	MUET
C No mention of 'F' or 'R' but Repeated courses annotated by the asterisked letter '(R)' with its meaning given in a footnote. '(R)' includes all improvements, including from Failed courses.	(NED, UIT, IIEE, DUET etc).
D No mention of 'F' or 'R'; only best scores/grades for each course transcribed whether achieved in one or multiple attempts.	SZABIST, Indus, KU etc

6. Models 'A' and 'D' represent the opposite ends. Model 'D' does not give any indication of attempts but a combination of summer courses, low CGPA and extended programme duration would suggest that there were issues with the student. Model 'C' does not address the issue of

negativity; rather it makes 'R' courses more pronounced by annotating them as such. Model 'B' addresses the issue of negativity to great extent by masking Failures and Repeats in somewhat mellowed down Number of Attempts which are indicated against each course. Model 'A' is the one being followed in the leading universities.

7. 'To Show' or 'Hide' is a debate which is both universal and age-old. Arguments galore both ways, with the majority suggesting that the problem is mere psychological, manifesting in such vocabulary as being 'spotless', 'flawless', 'perfect' etc. If this idealistic approach is set aside, the issue does not seem to remain that serious.

8. 'F' or 'R' endorsements on the transcript do not matter because a recruiter or admission officer looks at these grades in the context of other grades, the CGPA and the duration during which the programme was completed. If it is a case of isolated 'Fs' or 'Rs', with good CGPA, the recruiter understands that the applicant had a 'bad week' or two in the semester. After all, life and semester system are often at odds with each other, affecting the grades adversely. Call it 'inhumanity' of the semester system. What is important to the recruiter is the fact that the applicant was cognizant of his/her 'F' or low grades, dared these grades, retook the courses and brought them at par with the other grades. If still worried about 'Fs' or 'Rs', the applicant can always explain them in an explanatory note attached to the transcript.

9. On the other hand, if the transcript is replete with 'Fs' or 'Rs', and are not shown, there are the tell-tales in CGPA, the summer courses and the Time the applicant took to complete the programme. Consider a BBA completed in 6 years with a CGPA 2.0 with 'Fs' or 'Rs' not shown on the transcript; non-transcription of these grades cannot hide the credentials of the applicant. It can even have negative implications for the candidate and his/her alma mater.

Conclusion & Recommendation

10. 'To Show' or 'Hide' is a psychological issue. F Grade or R annotation is looked at in the context of other grades, the CGPA and the duration during which the programme was completed. 'Hiding' does not improve job prospects; rather it can have negative implications for the applicant and the university.

11. All factors considered, it is recommended that BU continues with its current result transcription practices.

Prof Dr M. Najam ul Islam
Dean E&ES

Cdre (R) Farrukh Mahfooz SI(M)
Director Examinations

M Ehsan Saeed
Director Academics

Two Typical Cases

Case	Interpretation by the Reader
<ul style="list-style-type: none"> • One or two 'F/R' • Transcribed • Good CGPA • Prog Dur Reg or Reg+ 	<ul style="list-style-type: none"> • Other grades good; applicant must have had a bad week or two in the semester • Applicant was cognizant of 'Fs' or low grades, retook the courses and brought them at par with the other grades
<ul style="list-style-type: none"> • 'F/R' galore • Not-Transcribed • Low CGPA • Prog Dur Reg+++ or Max or Extended • Transcript Cluttered 	<ul style="list-style-type: none"> • Applicant must have Repeated Failed or Low-Graded Courses • Alma mater hiding student's poor performance

Appendage 3038

MSPM at BULC – Regularisation of Admissions made at below the Eligibility CGPA

1. Mock Audit committee highlighted observations with regards to induction in MSPM with CGPA less than 2.5/4.00. Detail is attached at Annex A.
2. In this backdrop, it is submitted that eligibility criteria for MSPM Program was promulgated as CGPA (2.5/4.00 or 60% marks) or 50% marks (for annual system) in final Master's degree. Furthermore, the Cluster Head MSPM (BUIC) on visit to BULC, at that time, clarified the eligibility criteria and advised to use the CGPA or percentage, which ever is applicable, where both (CGPA and percentage) are endorsed on the original degree of the candidate.
3. It is pertinent to mention that all the cases highlighted in Annex A who were inducted in BULC with less than 2.5 CGPA have more than 60 % marks as required vide reference A. It is worth mentioning that once the subject issue was clarified vide Admission Policy 2016, not a single case with less than 2.5 CGPA was accepted at BULC nor observed by Mock Audit Team as clearly depicted vide Annex 'A'. Additionally, case of Mr Shawaz Hussain Baluch a student of Spring-14 i.e lesser CGPA taken up was approved.
4. Furthermore, Mock Audit highlighted a single case of Fall 16, wherein a student was inducted on the basis of MCS, instead of 4 Years BE degree. In light of guidance of Mock Audit team, the student was asked to furnish a certificate from HEC w.r.t equivalence of Master's degree with 16 Years of education, which has been duly submitted.
5. Above in view, it is requested that case of students at Annex A (next page) may please be regularized.

Annex A

INTAKE	CASE	Name	Enrollment	CGPA	%age	REMARKS
Fall 2016	-	NAUMAN SARWAR	03-298162-025*	Active student & submitted MCS degree, HEC Equivariance of 16 years of education		
INTAKE	CASES	Name	Enrollment	CGPA	%age	REMARKS
Fall 2015	5	1 HASSAN RIAZ	03-298152-039	2.18/4	63%	PASS OUT
		2 MOAZ TARIQ	03-298152-012	2.29/4	65%	PASS OUT
		3 SADD SATTAR	03-298152-021	2.29/4	66%	PASS OUT
		4 MUHAMMAD TAUQEER	03-298152-017	2.14/4	65%	PASS OUT
		5 FATIMA FIKRI	03-298152-032	2.34/4	60%	PASS OUT
Spring 2015	1	ALI HASSAN	03-298151-001	2.19/4	63%	PASS OUT
Fall 2014	5	1 FAHAD SALEEM	03-298142-011	2.45/4	62.50%	PASS OUT
		2 SYED TAIMOOR MAHMOOD	03-298142-035	2.47/4	63%	PASS OUT
		3 MUHAMMAD AMMAR HUMAYUN	03-298142-023	2.43/4	65.69%	PASS OUT
		4 NABEEL KHALID	03-298142-027	2.33/4	65.81%	PASS OUT
		5 ABRAR ASHRAF CHUGHTAI	03-298142-044	2.15/4	61%	PASS OUT
Spring 2014	5	1 DANYAL	03-298141-001	2.17/4	65%	PASS OUT
		2 ZEESHAN UL HAQ	03-298141-015	2.18/4	63%	PASS OUT
		3 NADIA IJAZ	03-298141-007	2.39/4	68.75%	PASS OUT
		4 SHAWAZ HUSSAIN BALUCH	03-298141-016	2.01/4 (Approval enclosed)		PASS OUT
		5 FAISAL ALI SHAIKH	03-298141-017	2.44/4	61%	PASS OUT
Fall 2013	3	1 MUHAMMAD OMER KHAN	03-298132-005	2.38/4	63.01%	PASS OUT
		2 MUHAMMAD BILAL KHAN	03-298132-024	2.07/4	61.67%	PASS OUT
		3 UZAIR AHMED	03-298132-025	2.10/4	62.22%	PASS OUT
* BUHO letter BU/AD/76/S-14/1237 dated 26 Feb 14						
** HEC letter 8(61)/A&A/2017/HEC/6042 dated 27 Jul 17						

SOP FOR STUDENTS' EXCHANGE WITH YEDITEPE UNIVERSITY, TURKEY**Background to the Case:**

In line with the Strategic Plan of Bahria University; one new agreement for exchange of students has been signed with Yeditepe University, Turkey

According to the exchange agreement, Bahria University can send up to 2 students in a year on exchange basis to Yeditepe University. There is no tuition fee that is to be paid by the student to Yeditepe University. The students will only have to bear their travel and living expenses in Turkey.

Bahria University already has similar agreement with Yasar University (Turkey), York St. John University (UK), AIMST University (Malaysia), Izmir University of Economics (Turkey) and Istanbul Kemerburgaz University (Turkey), with the SOPs for selection and credit transfer process, approved by the ACM.

Keeping in view the practice followed for the other five universities, an SOP has been prepared on the similar lines defining the students' selection and credit transfer mechanism under the exchange programme.

Recommendation:

It is recommended that the SOP prepared for the Exchange of Students with Yeditepe University, approved by the Competent Authority, to be ratified initiating the exchange activity with Yeditepe University.

SOP FOR OUTBOUND EXCHANGE STUDENTS FOR YEDITEPE UNIVERSITY, TURKEY

- a) Based on the maximum provision of students to be sent in an academic year i.e. 2, as set by Yeditepe University, Turkey; there shall be students selected from each campus of Bahria University including, Islamabad, Karachi & Lahore, to go on the exchange program to Yeditepe University. The maximum number of students that can be recommended by any Campus would be based on the percentage of number of relevant students at that Campus. In case suitable candidate(s) are not available in a campus, the seat may be transferred to the other campus.
- b) The recommendation of students is to be made by the following authorities:

CAMPUSES	Nominating Authority
• Islamabad Campus	Director Campus Islamabad
• Karachi Campus	DG Karachi Campus
• Lahore Campus	Director Campus Lahore

- c) The above authorities will interview and shortlist students from their respective campuses based on following selection criteria, which should reflect the highest quality of students:

Selection Criteria:

- i. The students must be a regular student of Bahria University taking full course load.
- ii. The minimum CGPA of the student should be 3.0.
- iii. The student must have studied for more than a year (2 semesters) with Bahria University.

- iv. The student must be proficient in English and have good communication skills.
- v. The student must not have any disciplinary cases against them and should be void of any attitude problem.
- d) The shortlisted students will be re-evaluated by a following member committee at Bahria University to shortlist students for final approval of Rector:

i. Pro-Rector	-	Chairperson
ii. Registrar	-	Member
iii. Advisor/Director Academic Affairs	-	Member
iv. Director Admissions	-	Member
v. Director Examinations	-	Member
vi. Director Students Affairs	-	Member
vii. Dy. Director (FCP)	-	Member
- e) The selected students must sign a written bond with Bahria University to return to Pakistan to continue their remaining studies with Bahria University or to complete remaining degree requirements.
- f) The responsibility of accommodation arrangement in Turkey, during the course of stay, will be on student. The International office will assist the selected students in finding suitable accommodation. In addition to the expenses pertaining to accommodation, students will also be responsible for travelling & visa/pass expenses, medical/health insurance or any additional service charges they wish to avail.
- g) The student will defer their semester prior going to Yeditepe University, Turkey, under the Exchange Programme. There shall be no tuition fee charged for this process. The decision on duration & number of semesters, to defer, is to be taken by the relevant Head of Department according to number of days the student will spend at Yeditepe University under exchange program. The student must adhere to departure and return dates as specified by his/her department.
- h) The duration of the semester(s) studies abroad will not be counted towards the calculation of time bar.

Eligibility for Honors & Awards:

- i) Students availing the exchange programme at the Yeditepe University will be eligible for academic honors & awards, as long as they are taking full semester loads in their studies at Bahria University.
- j) If, as a result of the exchange activity, any of their courses are affected, these students would be permitted to make up for the shortfall (of the affected courses only) on return to Bahria University either during the summer sessions, if offered, or during succeeding regular semester, in excess to their regular course load.
- k) If during the summer session,
 - i. the students take shortfall courses, they will be awarded actual grades and no capping will apply.
 - ii. the students take any course, which were not affected by the exchange programme, summer session rules will apply and the students will become ineligible for Honors & Awards.

Transfer of Credits as a result of an Outbound Exchange Program:

- I) Student interested in registering for the courses at Yeditepe University, for which they can avail **credits transfer** at Bahria University, shall be properly advised by the relevant Head of Department about the compatibility of the courses they wish to take, based on the course content, before departure.
- m) The student must inform their Head of Department about the possible courses they wish to take at Yeditepe University along with the course outline. A preliminary meeting of the Equivalence Committee should take place, before the departure of student. The committee shall give clear instructions to the student, in writing, on a prescribed form (attached), on the course(s) he/she can take to avail **credits transfer**, against course(s) of similar nature, at Bahria University as per the road map of the program he/she is studying.
- n) The final decision on **credits transfer** is to be taken, on return of the student, and successful completion of the courses, as per following criteria:
 - i. Students applying for **credits transfer** are to submit original interim transcript and the course outlines of the course(s) studied at Yeditepe University to their relevant Head of Department (HOD) on return. The HOD will then formulate an Equivalence Committee to make final recommendations to their relevant Director of Institute. The Director will then forward recommendation of the Equivalence Committee for final approval to Advisor/Director Academic Affairs. There shall be no fee charged from the student for **credits transfer**.
 - ii. **Credits transfer** of courses will only be allowed for Degree level programs (*equivalent to similar level program at Bahria University*) offered on campus.
 - iii. **Credits transfer** for only those courses will be allowed for which a course with similar standard, credit hours and matching description is available in the relevant academic program of Bahria University. As the marking criteria at Yeditepe University is different from what is followed at Bahria University, therefore following grade mapping mechanism is to be followed:
- iv. The courses must equate in description and laboratory work, if any, with the similar course of the relevant academic program of Bahria University.
- v. **Credits transfer** of courses equating to maximum of 50% of the total credit hours of the relevant academic program of Bahria University will be allowed.

	Grade at Yeditepe University	GPA Points at YU	Equivalent Grade at Bahria University
a	AA	4.0	A
b	BA	3.5	B+
c	BB	3.0	B
d	CB	2.5	C+
e	CC	2.0	C
f	DC	1.5	D
i	DD	1.0	F
j	FF	0.0	F
H	FA (Fail due to attendance)		F

SOP FOR INBOUND EXCHANGE STUDENTS FROM YEDITEPE UNIVERSITY

- a) Bahria University will accept two students from Yeditepe University under the exchange program in any given academic year.
- b) Only students recommended by the International office of Yeditepe University will be entertained under this arrangement.
- c) The inbound students from Yeditepe University will be advised on the availability of courses, which they want to take at Bahria University, after consultation with the HOD of the relevant department. The HOD must ensure that there are no clashes between the selected courses by the individual.
- d) The student will be responsible for own accommodation arrangement in Pakistan, but the International office of BU will assist in finding suitable accommodation.
- e) There shall be no tuition fee charged by Bahria University from students of Yeditepe University under student's Exchange program. An admission fee for the relevant programme would be applicable to the selected students.

On successful completion of the course work at Bahria University, the student will be responsible to meet the credits transfer requirements of Yeditepe University, as per its own policy. Bahria University will only award official interim transcript to the student for courses he / she has studied at Bahria University.

Appendage 3040**STANDARDIZATION OF THESIS STRUCTURE****Background**

1. Currently, Thesis/Research comprises of 6 credit hours for MS/MPhil programs and 36 credit hours for PhD programs. However, every program have its own course code for thesis and have different structuring which simply adds confusion and unnecessary complexity. There are at least 41 course codes referring to MS/MPhil and PhD Thesis/Dissertation.
2. Uniformity of thesis structure across the departments/faculties can reduce the inconsistency and resultantly ambiguity/complexity in thesis execution.
3. Standardization of thesis structure has been discussed in 21st Special HERC meeting held on 18th July 2017 with the following recommendations:
 - a. Bifurcation of registration of Research work/thesis in 2 semesters for MS/MPhil program of 2 years' duration.
 - b. There shall be standard course codes for thesis at MS/MPhil and PhD level across all the departments/faculties as mentioned below:

Course Code	Course Title	Credit Hours	Program
THS-900*	PhD Thesis	9	PhD
THS-701**	Thesis	3	MS/MPhil (2 years)
THS-702	Thesis	6	MS (1.5 years)

- * PhD Scholar shall have to register this course at least in 4 semesters to complete the mandatory 36 CHs of research work
 - ** MS/MPhil research student shall have to register this course at least in 2 semesters to complete the mandatory 6 CHs of research work
4. HERC approved the mechanism of standardization of thesis structure (vide HERC Item No. 2101) as specified in para 3 of this agenda item.

Recommendations:

As the case pertains to the change of course codes and splitting of thesis across two semesters instead of one (in some cases), it comes in the preview of ACM. It is recommended that HERC decision may please be ratified. Standardization of thesis structure is recommended to implemented from Spring 2018 for all PG programs and intakes. **(End of Document)**