

**Minutes
of
35th Meeting of Academic Council**

held on

Wed 22nd & Thu 23rd July 2020

Through BUHO Conference Room



Directorate of Academics

Bahria University Islamabad

Reference Designators & Terms used in this Document

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

Item Number **oonn**, where oo = ordinal sequence of the Academic Council Meeting.

 nn = serial number of Item in that meeting.

Example: Item 2213 means item No 13 taken up by the 22nd ACM

**Decision on
New Item**

Oonn

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**

o₂o₂(oonn)

Example: Decision 22(1930) means Decision taken by the 22nd 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:

- a. Coordinate the actions taken by the Authorities, Entities, Officials, Persons, Units, Depts, Offices, etc listed against "Action".
- b. Report to the Council the progress on the matter, through periodic progress reports and at the meeting of the Council.
- c. Be responsible to the Competent Authority, and the Council, for the case/issue overall /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 25th 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.

Acronyms & Abbreviations used in this Document

AACSB	Association to Advanced Collegiate School of Business
BUAR	Bahria University Academic Rules
BUMDC	Bahria University Medical & Dental College
BUCPT	Bahria University College of Physical Therapy
CCH	Course Codes Handbook
CH	Credit Hour(s)
CE	Computer Engineering
CIS	Centre for Islamic Studies
CS	Computer Sciences
CSE	Computer & Software Engineering
DIC	Director Islamabad Campus
DIPP	Director Institute of Professional Psychology
DKC	Director Karachi Campus
DLC	Director Lahore Campus
DNIMA	Director National Institute of Maritime Affairs
DNCMP	Director National Centre for Maritime Policy Research
DS	Dental Section BUMDC
EDC	Estimated Date of Completion
EE	Electrical Engineering
EES	Earth & Environmental Sciences
EMBA	Executive Master of Business Administration
EP	Examinations Policy
ES	Engineering Sciences
FHB	Faculty Handbook
FYP	Final Year Project
HS	Health Sciences
HSS	Humanities & Social Sciences
iaw	in accordance with
IR	International Relations
MSS	Management & Social Sciences
MS	Management Sciences
NBEAC	National Business Education Accreditation Council
OACM	Online Academic Council Meeting
PMDC	Pakistan Medical & Dental Council
PNC	Pakistan Nursing Council
PNNC	Pakistan Navy Nursing College
PNMTS	Pakistan Navy Medical Training School
PFM	Permanent Faculty Member
PEO	Program Educational Objectives
PH	Public Health
QAL	Quranic Arabic Language
ToS	Table of Specifications
SE	Software Engineering
SHB	Students Handbook
SCM	Supply Chain Management
T&N	Telecom & Networking
URD	User Requirements Document
VFM	Visiting Faculty Member

Table of Contents

Reference Designators & Terms used in this Document.....	2
Acronyms & Abbreviations used in this Document.....	3
Attendance	7
Proceedings	9
Preliminaries.....	9
Amendments	9
Review Items	12
Item 2009: Indigenous PG Programs (MPhil & PhD) in Basic Health Sciences at BUMDC, Commencement of	12
Item 2234: BULC Admission Criteria of Programs - Progress Report	13
Item 2334: BBA and MBA Programs - Heuristic and Flipped Classroom Methods of Teaching and Evaluation.....	14
Item 2432: MS Supply Chain Management at BUKC - Progress	15
Item 2619: MS in HRM & Organizational Psychology at BUKC - Progress.....	15
Item 2709: MS Islamic Banking & Finance at BUIC - Progress.....	15
Item 3138: Business School at BUIC - Creation from Existing MS Department.....	16
Item 3205: PhD Program in Geo-Physics at BUIC- Progress	16
Item 3213: Launch of MS (Maritime Ports and Shipping Management) at BUKC	17
Item 3214: Review of Roadmap of MS (Maritime Trade and Logistics) at BUKC	17
Item 3301: Establishment of School of Maritime Sciences at BUKC	17
Item 3307: MS Economics at BUIC - Launch Proposal	18
Item 3316: Launch of Lateral Entry of Graduates with 14 years Education (BA/B.Sc/B.Com etc) into 5 th Semester of BBA Program through Bridging Semester.....	19
Item 3321: Approval of 4.5 Years as Minimum Duration of the Bachelor of Science in Supply Chain Management Program being conducted by the PNSL.....	20
Item 3405: Amendment in Eligibility Criteria of LLM Program.....	21
Item 3411: Modular Teaching at FMDC.....	21
Item 3412: To Devise a Uniform Policy for Award of Medals and Merit Certificates to Undergraduate and Postgraduate Students of Semester-based Programs of Health Sciences at BUMDC aligned with Existing Criteria of BU	22
Item 3420: Introduction of Islamic Studies Courses for Grooming of Students	23
Item 3421: Approval of New Undergraduate Program - Bachelor of Science in Public Health iaw HEC Curriculum.....	23
Item 3422: Bachelor of Science in Supply Chain Management - Launch Proposal.....	24
Item 3425: Review of Penalties for Academic Misconduct	25
New Items.....	25

Item 3501: Addition in Elective Course in LLM & PhD	25
Item 3502: Offering BBA 2 Years on Weekend Format	26
Item 3503: Clarification on Summer Courses of BBA 2-Years Program.....	26
Item 3504:Suggested Amendments in Existing BU Semester Examination Rules (Summer Session) Regarding Semester-based Health Sciences Programs at BUM&DC Karachi	27
Item 3505: Correction in 02 Credit Hours for DPT Program	29
Item 3506: Inclusion of Course English-VIII in BS (Nursing) Annual & Semester-based Programs	30
Item 3507: Approval of Curriculum and Table of Specifications (TOS) of Family Medicine	31
Item 3508: Establishment of Bahria University Post-Graduate Institute of Health Sciences (BU-PGIHS); Updated Vision, Mission Statement, Terms of references, Objectives, Outcome, Organogram of BU-PGIHS for Deliberation and Approval	31
Item 3509: Launch of MPhil (Biochemistry) and MPhil (Physiology) to complete Phase-I of Postgraduate Institute of Health Sciences (BU-PGIHS); Updated Vision, Mission Statement, Objectives, Outcome, Rationale, Roadmap and Curriculum of Respective Programs aligned with Existing MPhil Programs for Approval.....	33
Item 3510:Approval of Marks Distribution in MPhil Programs (Anatomy, Pharmacology and Pathology)	34
Item 3511: Revision of MS (Electrical Engineering) Roadmap.....	34
Item 3512: Modification of Eligibility Criterion for BS (IT) & BS (CS) Programs.....	35
Item 3513: Changes in Elective Courses of BSE Program	36
Item 3514: Revision of Program Educational Objectives (PEOs)	37
Item 3515: Enhancement in Result Submission Process & Examination Module in CMS	37
Item 3516: Introduction of New Bachelor of Science Program in Geosciences (with Specializations: Marine Geology, Marine Geophysics; GIS & Remote Sensing)	38
Item 3517: Declaration of Semester Result of PG Students upon Submission of Thesis/ Project Work...	40
Item 3518: Merging of BU Affiliation Committee and Technical Evaluation Committee.....	40
Item 3519: Amendment in BU Academic Rules Chapter 9 and Table 2 (Chapter 3)	42
Item 3520: Inclusion of New Course “Foreign Policy of United States” in MS (IR) as an Elective	42
Item 3521: Replacement of Compulsory Courses as Elective Course “Foreign Policy Analysis & Seminar on Regional and Global Contemporary Issues” and inclusion of New Compulsory Course “Traditional and Non-Traditional Security Paradigms” in MS (IR) roadmap	43
Item 3522: Inclusion of new course “Nuclear Security and Non-Proliferation” as Elective in BSS (IR) Roadmap	44
Item 3523: Change in Admission Criteria of MS-IR.....	45
Item 3524: Revised Course Outline of Islamic Studies for Undergraduate Programs.....	45
Item 3525: Weightage Criteria/Formula for all UG Programs	46
Item 3526: Increase in CBTs Passing Marks from 33% to 40%	46
Item 3527: Re-Constitution of Standing Committee for Award of Medals at Convocations	47

Minutes of 35th ACM

Item 3528: Amendment of BU Academic Rules 7.14.1 and 7.14.2.....	48
Item 3529: Depicting of Deficient Courses in Students' Transcript.....	49
Item 3530: Establishment of BU Schools at BUIC & BUKC.....	50
Closing the Meeting	50
Appendage 35(2234).....	51
Appendage 35(2334).....	61
Appendage 35(3421).....	67
Appendage 35(3425).....	123
Appendage 3501	129
Appendage 3507	146
Appendage 3508	163
Appendage 3509	171
Appendage 3510	241
Appendage 3511	242
Appendage 3512	248
Appendage 3513	249
Appendage 3514	251
Appendage 3516	253
Appendage 3517	292
Appendage 3519	293
Appendage 3520	296
Appendage 3521	298
Appendage 3522	302
Appendage 3524	306
Appendage 3527	314
Appendage 3529	315
Appendage 3530	316

Attendance**BUHO****Present**

1. Vice Admiral Kaleem Shaukat HI(M)	Rector	In Chair
2. Surg Rear Adm (R) Najm Us Saqib Khan HI(M),T.Bt (Retd)	Pro-Rector (HS)	Member
3. Rear Admiral Nasir Mahmood HI(M) (Retd)	Pro-Rector (RIC)	Member
4. Rear Admiral Habib Ur Rehman HI(M) (Retd)	Pro-Rector (Acad)	Member
5. Cdre Shafqat Azad SI (M), S.Bt	Registrar	Member
6. Prof. Dr. Atif Raza Jafri	Dean (ES)	Member
7. Associate Prf. Dr. Ali Imtiaz	Dean (MS)	Member
8. Associate Prof. Dr. Adam Saud	Dean (H & SS)	Member
9. Senior Associate Prof Dr. Riaz Ahmed	Dir (Academics)	Member & Secy
10. Cdre Asim Raza SI(M) (Retd)	Controller of Exams	Member
11. Cdre M Mateen Ur Rehman SI(M) (Retd)	Dir Admissions	Member
12. Captain Tariq Rashid PN (Retd)	Acting Dir Health Sciences	Member
13. Prof. Dr. Shehzad Khalid	Dir R&D/ORIC	Member
14. Senior Associate Professor Mr Fazal Wahab	Dir DQA	Member
15. Senior Assistant Prof. Khalid Mumtaz	Dir LDC	Member

In Attendance

16. Dr Habib ur Rehman Asim	Dir CIS
17. Ms. Sundal Mufti	Dir Student Affairs
18. Dr. Asim A Awan	Dir Marketing
19. Senior Assistant Prof Mr Rizwan Aamir	Dir IT
20. Senior Assistant Prof Mr M Awais Mehmood	Dir IO
21. Capt Azhar Iqbal PN (Retd)	Dy. Registrar (Academics)
22. Cdr Amer Abdullah PN (Retd)	Dy. Director (Academics) (UG)

BUIC**Present**

23. Rear Admiral Naveed Ahmad Rizvi HI(M) (Retd)	DG BUIC	Member
24. Cdre Asif Majeed Butt (Retd)	Director	Member
25. Senior Prof Dr Tehseen Ullah Khan	HOD (EES)	Member
26. Senior Prof Dr Syed Abdul Siraj	HOD (Media Studies)	Member
27. Prof. Dr Muhammad Arif Khattak	HOD (MS)	Member
28. Associate Prof. Dr Muhammad Ali Saeed	HOD (BS)	Member
29. Associate Prof Dr Awais Majeed	HOD (SE)	Member
30. Senior Assistant Prof Dr Muhammad Umar Hayat	HOD (HSS)	Member
31. Senior Assistant Prof Dr. Khalid Javed	HOD (CE)	Member
32. Senior Assistant Prof Dr. Noshi Iram Zaman	HOD (PP)	Member
33. Senior Assistant Prof Ms Malieka Farah Deeba	HOD (Law)	Member
34. Senior Assistant Prof Dr Junaid Imtiaz	HOD (EE)	Member

BUKC**Present**

35. Cdre Muzammil Hussain SI(M) (Retd)	Ag DG/ Director	Member
36. Prof. Dr. Bashir Ahmad	Associate Dean (MS)	Member
37. Senior Associate Prof Dr Sohaib Ahmed	Principal (SEAS)	Member
38. Dr. Asif Inam	HOD (Maritime Sciences)	Member
39. Dr. Syed Shahid Ali	HOD (E& ES)	Member
40. Senior Assistant Prof. Dr. Najam M Amin	HOD (EE)	Member
41. Dr. Oyoon A Razzaq	Ag HOD (HSS)	Member
42. Senior Asstt Prof Dr Syed Safdar Rizvi	HOD (CS)	Member
43. Senior Asstt Prof Dr Rizwan Iqbal	HOD (CE)	Member
44. Senior Lecturer Mahe Darakhshan	HOD (Media Studies)	Member

In Attendance

45. Captain Zaheer Ahmad PN	DD (Academics)
46. Cdr Syed Nadeem Hasan Shah PN (Retd)	DD (Examinations)
47. Cdr Imran Ishtiaq Qureshi PN (Retd)	DD (Admissions)
48. Saqib Shibli	DD (Marketing)
49. Senior Asstt Prof. Dr. Haris Ahmed Khan	Prof (Geophysics Department)
50. Ms. Erum Shafiq	AD (QA)
51. Arif Ansari	Manager IT
52. Syed Rizwan Ali	Manager BIC
53. Umair Zafar	Manager SSC
54. Cdr Sajjid Hussain PN	Chief Instructor PNSL
55. Lt Cdr Dr. Malik Mamoon Munir PN	Training Coordinator Officer PNSL

BULC

Present

56. Cdre Shahid Azmat Wain SI(M) (Retd)	Director	Member
57. Associate Prof Dr Urooj Sadiq	HOD (PP)	Member
58. Senior Asstt Prof Mr Farhan Saeed Sherazi	HOD (CS&IT)	Member
59. Assistant Prof Dr Muhammad Ahmad	HOD (MS)	Member

In Attendance

60. Mr. Muhammad Umair Saeed	Manager QA
------------------------------	------------

BUMDC

Present

61. Rear Adm Imtiaz Ahmad HI(M) (Retd)	DG BUMDC	Member
62. Prof Dr Ambreen Usmani	Dean HS/ Principal	Member
63. Prof Dr Wahab Bukh Kadri	Principal (DS)	Member
64. Prof. Dr. Khalid Mustafa	Vice Principal (Med)	Member
65. Dr Kulsoom Fatima	Vice Principal (DS)	Member
66. Senior Associate Prof Dr Khalid Aziz	Vice Principal (BUCPT)	Member
67. Prof Dr Nasim Karim	HOD(Pharmacology)	Member
68. Lt Cdr Maryam Behram PN	Principal PNNC	Member
69. Prof. Dr. Nighat Rukhsana	HOD (Physiology)	Member
70. Prof. Dr. M Sajid Abbas Jaffri	HOD (Medicine)	Member
71. Prof. Dr. Hasan Ali	HOD (Biochemistry)	Member
72. Prof. Dr. Nighat Rukhsana	HOD (Physiology)	Member
73. Dr. Mahreen Lateef	HOD (MDRL/Secy PGP)	Member

In Attendance

74. Prof. Dr. Shaziz Shakoor	Professor of Physiology
75. Brig Shahid Ali Khan (Retd)	Clinical Coordinator
76. Dr. Sadaf Haris	Senior Lecturer Family Medicine

IPP

Present

77. Prof Dr Zainab Hussain Bhutto	Dean PP/ Principal	Member
78. Dr. Kiran Bashir Ahmed	HOD (IPP)	Member

Proceedings

Preliminaries

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

1. With the quorum complete, the proceedings commenced at 11:00 hrs with recitation from the Holy Quran and continued till 1615 hrs on 22 & till 1730 hrs on 23rd July 2020. The meeting recessed for lunch and prayer at 13:00 hrs and resumed proceedings at 1400 hrs on both days.
2. In his opening remarks, the Chair thanked the participants and emphasized upon conducting the session in a crisp and focused manner.
3. Confirmation of the Minutes of the 34th ACM held on 13 & 14 Nov 2019
4. The Secretary apprised the Council that:
 - a. Draft minutes of the 34th ACM were communicated to all members and non-member participants for comments on 27th Nov 2019. No comments or observations were received.
 - b. Consequently, the draft minutes were processed on file for approval of Honorable Rector and approved minutes were disseminated to all concerned on 23rd Dec 2019 through email.

Amendments

5. Later on, HOD (EE) BUKC initiated email for following amendments in Item # **3401 para 123 of 34th ACM MoM:**

a. **For para 123:**

The dynamics of industry are changing, laying a premium on relevant new elective courses for students of engineering & computing specializations. Following electives have been identified in FBoS-ES for addition to the pool of electives for Electrical Engineering undergrad program:

Course Codes	Course Title	Credit Hours	Type
CSC 488 (30th ACM)	Big Data Analytics	03	Depth Elective
CSC 410 (27th ACM)	Introduction to Cloud Computing	03	Depth Elective
CSC 412 (14th ACM)	Artificial Intelligence	03	Depth Elective
EET 461 (New Course)	Industrial Internet of Things (IIoTs)	03	Depth Elective
MGT 426 (New Course)	Sales and Marketing Strategies for Engineers	02	Management Science Elective

b. Read para 123:

The dynamics of industry are changing, laying a premium on relevant new elective courses for students of engineering & computing specializations. Following courses have been identified in FBOS ES for addition to the pool of IDEE electives for Electrical Engineering undergrad program:

Course Codes	Prerequisite	Course Title	Credit Hours	Type
SEN 332 (30 th ACM)	None	Big Data Analytics	3+0	IDEE Elective
SEN 325 (25 th ACM)	None	Cloud Computing	3+0	IDEE Elective
CSC 412 (14 th ACM)	Object Oriented Programming	Artificial Intelligence	3+0	IDEE Elective
EET 461 (New Course)	Object Oriented Programming	Industrial Internet of Things	3+0	IDEE Elective
MGT 426 (New Course)	None	Sales and Marketing Strategies for Engineers	2+0	Management Science Elective

6. Para 126 of 34th ACM MoM may also be amended as under:

a. For para 126:

Proposed electives as per Appendage 3401 approved by Council wef Spring 2020 intake.

b. For Read para 126:

Proposed electives as per Appendage 3401 approved by Council from Fall 2019.

7. Following amendment in Appendage 3401 of 34th ACM MoM may be amended as under:

a. For:

Course Title: Big Data Analytics

Course Code: CSC 488

Credit Hours: 3

Prerequisite: Programming Fundamentals

b. Read:

Course Title: Big Data Analytics

Course Code: SEN 332

Credit Hours: 3+0

Prerequisite: None

c. For:

Course Title: Introduction to Cloud Computing

Course Code: CSC 410

Credit Hours: 3+0

Prerequisite: None

d. **Read:**

Course Title: Cloud Computing
Course Code: SEN 325
Credit Hours: 3+0
Prerequisite: None

Decision

8. Proposed amendments were agreed by the Council, thereafter MoM 34th ACM held on 13 & 14 Nov 2019 were tabled for confirmation including the amendments mentioned in para 5, 6 & 7.

9. MoM were approved with amendments and confirmed by the Council.

Review Items

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

Decision of the 34th ACM

10. After discussion, following were decided:
- The Concept Paper be forwarded formally for evaluation/processing at BUHO prior consideration for approval.
 - Establishment of Animal House & PG Programs of BUMDC be retendered.
 - Point to remain on agenda and progress to be reported.

Progress Reported

11. Improved concept paper of BU/PGIHS with incorporated suggestions of DQA approved by DBOS & FBOS presented to Honorable Rector, BU through VLC Meeting regarding BU PGIHS established on 29 April 2020.

12. Revised improved concept paper documents of BU PGIHS after incorporating further suggestions of DQA is submitted to DHS office on 24 June 2020 in continuation of File No. BU-DHS-47(PG)/PC of Bahria University for approval by the Competent Authority on file and ratification in the forthcoming ACM.

13. Launch of MPhil Biochemistry & MPhil Physiology is required to complete Phase-1 of Bahria University Post graduate institute of health sciences (BU-PGIHS) (up dated vision, mission statement, objectives, outcome, rationale, roadmap and curriculum of respective programs aligned with the existing MPhil programs) is submitted for approval by the auspicious forthcoming ACM forum. Launch is condition to fulfillment of existing deficiencies (availability of PhD faculty, up-gradation of library, Functional animal house) to get NOC from PMDC & HEC.

14. Phase-1 of animal house is in progress. Advertisement for hiring of veterinary head of the animal faculty given. Shortlisting of CVs done. Intake of Animal House staff and Phase-2 of Animal house will be undertaken by the inducted Head.

15. Batch-1 MPhil programs students have received transcripts in June 2020. Template of Degree received from Deputy Registrar (Degree) for 03 MPhil programs approved by HODs and Chairperson PGP-TM is sent to BU on 10 July for processing.

16. Batch-2 MPhil programs students are in final phase for thesis submission & will defend thesis in September 2020.

17. Batch-3 MPhil programs students have been completed Final Term Spring Semester Exam on 14th July 2020.

18. Advertisement for induction of Batch-4 MPhil programs given on 14th June & 12th July. Admission process is underway. The entry test (CBT) is scheduled on 08 August 2020.

Discussion

19. It was apprised that details regarding Concept Paper/PG Programs proposal were covered in agenda item # 3508 raised by BUMDC. Furthermore, progress on Animal House and appointment of Veterinary Head of Animal faculty was also presented.

Decision 35(2009)

20. Point may be kept in Agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean HS	DG BUMDC
Statutory Documents Affected:	-	

Item 2234: BULC Admission Criteria of Programs - Progress Report

Responsibility: Director BULC

Decision of the 34th ACM

21. After discussion, the Council resolved that:

- a. Status quo w.r.t continuation of existing admission criteria be maintained.
- b. Study Report regarding fee structure along with recommendations be forwarded to BUHO separately after comparison of fee structure of other HEIs at Lahore before next ACM.
- c. Point to remain on agenda and progress be reported.

Progress Reported

22. Three students of BBA & 2 students of BS (Psychology) availed 5% waiver in admissions of Spring 2020.

23. Continuation of existing admission criteria may please be maintained.

24. Study Report regarding free structure comparison received from BULC is attached at Appendage 35(2234) (page 51).

Discussion

25. Director BULC presented the contents of study report. Various issues relating to fee structure at BULC in contrast to other HEIs at Lahore were highlighted. The Rector inquired regarding the efficacy of strategy based on offering discounts to students and it was apprised that the same would lead to attracting large number of students. During extensive deliberations, need for MoUs/strategic alignments with the Corporate Sector was generally agreed. Recommendations of the study report were thoroughly deliberated.

Decision 35(2234)

26. The Council decided following:

- a. BULC is to initiate MoUs with corporate sectors/banks etc on mutually beneficial terms along with proposal for discount in fee structure.
- b. Revised fee structure for all other categories along with provision of discount be also forwarded separately.
- c. Admission for the current semester be conducted in one phase in accordance with the BULC proposed timelines.
- d. Waiver of admission criteria for BBA and BS (Psychology) be continued.

- e. Point is to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director BULC	Director BULC
Statutory Documents Affected:	-	

Item 2334: BBA and MBA Programs - Heuristic and Flipped Classroom Methods of Teaching and Evaluation

Responsibility: DG BUKC

Decision of the 34th ACM

27. After prolong deliberation, the Council decided that:

- a. Before next ACM, a complete roadmap for implementation of Heuristic and Flipped Class room method of teaching and education along with incorporation of assessment/ examination methodology, Learning Management System, IT support and lecture recording system be forwarded to BUHO through Deans Committee headed by DG BUKC.
- b. Point to remain on agenda and progress be reported.

Progress Reported

28. A committee headed by DG BUKC was constituted to work a complete roadmap for implementation of Heuristic and Flipped Class room method of teaching and education along with incorporation of assessment/examination methodology, Learning Management System, IT support and lecture recording system. Committee report is attached as Appendage 35(2334) (page 61).

Discussion

29. Recommendations of the study report were presented by DG BUKC. Dean MS emphasized that considering the technicalities associated with the subject, there is a need for value addition at respective stakeholder's end. Rector desired that the instant case and all other such cases need to be processed expeditiously for value addition and input from Deans and head office level be obtained prior approval by the Competent Authority.

Decision 35(2334)

30. The Council resolved following:

- a. Study report/proposal be processed on file for perusal/approval by Rector BU within one month. Input from relevant stakeholders, Deans and value addition at head office be ensured.
- b. Point is to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	All Deans/ Principals Director LDC	DG BUKC
Statutory Documents Affected:	-	

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

Responsibility: Dean MS & DQA

Decision of the 34th ACM

31. Hunting for the relevant two PhD Faculty members in the field of Supply Chain Management be continued. Both items to remain on agenda and progress be reported.

Progress Reported

32. Dr. Mahmood Ali, PhD in Supply Chain Management was selected by the Selection Board and offered joining letter but he declined to join on our terms of salary and privileges. Efforts are in hand to hire two PhD in SCM for further pursuing MS (SCM) case pending in HEC.

33. MS (Human Resource Management and Organizational Psychology) has been approved by HEC vide letter No-1-09/2020/QAD-NOC/HEC/BU/754 dated 06 February 2020. The program has been planned to be launched/offered in Fall 2020 in collaboration with IPP.

Discussion

34. Issues pertaining to availability of requisite FMs were extensively deliberated. Considering limited availability of qualified FMs in SCM, conduct of the program at BUKC/PNSL was agreed through joint efforts between BU and PN. Training commander PNSL offered assistance in the conduct of the program at PNSL; fully available on weekends. Further modalities may be discussed at FBOS level (if required). Dean MS stated that this would be a highly impactful program considering present and future market demand.

Decision 35(2432 & 2619)

35. The Council decided that:

- a. Search for requisite PhD faculty is to be continued and the program would be run on a joint location.
- b. Item 2432 is to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director BUKC Director HR Principal BBS, BUKC	Dean MS

Statutory Documents Affected: -

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

Responsibility: Dean MS

Decision of the 34th ACM

36. Deans Committee be formed to study and may propose MS Programs on yearly basis.

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

Progress Reported

38. MS Islamic Banking & Finance was temporarily halted and was not offered in Spring 2020 due to low intake and low profitability issue. Effective measure be taken for its long-term sustainability and progress. It is thus suggested that:

- a. Program may be offered once a year i.e. in the Fall Semester only with exclusive advertising.
- b. Minimal discount may also be offered to the Islamic Banking industry individuals.

Discussion

39. Low intake/market demand was highlighted. Option of offering a specialization in Islamic Banking and Finance in regular programs at BU was also discussed.

Decision 35(2709)

40. The Council decided that the program may be halted/frozen for the time being and the point is to be dropped from ACM agenda. The same may be re-started upon availability of suitable Faculty.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD (MS) IC	Dean MS
Statutory Documents Affected:		-

Item 3138: Business School at BUIC - Creation from Existing MS Department

Responsibility: DG BUIC

Decision of the 34th ACM

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

Progress Reported

42. Business School is functioning in the New Academic Block with Business Studies and Management Studies Departments conducting their classes.

Discussion

43. The Chair appreciated the efforts put in by the team involved in AACSB accreditation of BU BS.

Decision 35(3138)

44. Point was dropped from ACM agenda.

Item 3205: PhD Program in Geo-Physics at BUIC- Progress

Responsibility: HOD (EES) BUIC

Decision of the 34th ACM

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

Progress Reported

46. The PhD Geo-Physics has already been started from Fall 2019.

Decision 35(3205)

47. The Council decided to drop the item from ACM agenda.

**Item 3213: Launch of MS (Maritime Ports and Shipping Management) at BUKC
Item 3214: Review of Roadmap of MS (Maritime Trade and Logistics) at BUKC**

Responsibility: Dean MS

Decision of the 34th ACM

48. The Council decided that:

- a. Dean MSS is to see intake of Spring Semester and forward comprehensive proposal regarding curriculum review leading to finalization of approach to HEC for changes in the programs.
- b. Both points to remain on agenda and progress be reported.

Progress Reported

49. A Corporate Advisory Committee for School of Maritime Sciences has been formulated at BUKC and the first meeting is scheduled to be held in the last week of March 2020. The review of the curriculum of MS Maritime Programs will be discussed during the said meeting. Further, course of action would be taken accordingly.

Discussion

50. Dr Asif Inam briefed that processing/meetings of Corporate Advisory Committee were halted due to lockdown and the same are being rescheduled during first week of August 2020. Associate Dean (MS) explained that road map of a hybrid program for Ports and Shipping Management and Logistics will be worked out in order to conduct classes at a single location.

Decision 35(3213 & 3214)

51. The Council decided that both items are to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD (Maritime)	Associate Dean (MS)
Statutory Documents Affected:	-	

Item 3301: Establishment of School of Maritime Sciences at BUKC

Responsibility: DG BUKC

Decision of the 34th ACM

52. The Council decided that:

- a. Innovation Centre at BUIC be visited by DG BUKC to study/replicate the model/facility.
- b. Moreover, efforts to arrange extra land from HQ COMKAR/PNS JAUHAR be also continued for favorable outcome.
- c. Point to remain on agenda and progress be reported.

Progress Reported

53. Visit of Innovation Centre BUIC was conducted on 09 Jan 2020.

54. Proposed location/model of Innovation Centre at BUKC has been included in building plan at 6.5 kanal land allocated by NHQ and same has been forwarded to BUHO. May be pursued with NHQ through BUHO.

Discussion

55. Honorable Rector inquired about the progress regarding Master Plan and hiring of consultant. Director BUKC informed that the details have already been sent to BUHO. Rector directed that current development plans demand that requirement of Innovation Centre may be adjusted in the Master plan of School of Maritime Sciences in consultation with Pro-Rector (RIC).

Decision 35(3301)

56. The Council resolved that:

- a. Requirement of Business Incubation Center (BIC) may be suitably upgraded.
- b. Approval process of the Master Plan of 6.5 Kanal land having Business Incubation Center be expedited.
- c. Till raising of separate infrastructure, Maritime Sciences is to act as a Department of Bahria Business School.
- d. The point is to remain on agenda and the progress may be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Associate Dean (MS) HOD (Maritime)	DG BUKC
Statutory Documents Affected:		-

Item 3307: MS Economics at BUIC - Launch Proposal

Responsibility: Director BUIC

Decision of the 34th ACM

57. The Council decided that:

- a. 1st Semester of the program be commenced wef Fall 2020.
- b. Point to remain on agenda and progress be reported.

Progress Reported

58. MS Economics Program is a 2-years degree program. The NOC from the HEC has already been received and the department will launch it in Fall 2020 as per the 34th ACM decision.

Discussion

59. Low intake in the program was pointed out against the targeted strength. Dean MS stated that the program has a potential to grow in future.

Decision 35(3307)

60. The point is to remain on agenda and the progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD (MS) IC	Dean MS
Statutory Documents Affected:		-

Item 3316: Launch of Lateral Entry of Graduates with 14 years Education (BA/B.Sc/B.Com etc) into 5th Semester of BBA Program through Bridging Semester

Responsibility: Dean MS

Decision of the 34th ACM

61. After detailed deliberation the Council decided that program be launched at BUIC and BUKC, whereas for BULC, Dean MSS is to conduct a feasibility study for launch of the program.
62. Point to remain on agenda and progress be reported.

Progress Reported

63. **BUIC**. BBA 2-years program was started in Fall 2019. Total 33 students were registered in Fall 2019 semester and 24 students are registered in Spring 2020 semester.

64. **BULC**

- a. Launch of BBA 2 years as morning program was not successful.
- b. Point is being taken to 35th ACM by the Associate Dean M&SS to run this program over the weekend. Once it is approved, BULC will launch BBA 2 years from Spring 2021 as weekend program.

65. **BUKC**

- a. Program has already been launched in BUKC with effect from Fall 2019. There were 21 Students in Fall 2019 in the morning shift of BBA 2 Years programs. However, evening shift could attract only 4 students. Therefore, same was not started in the evening format.
- b. In Spring 2020, the program attracted 14 and 8 students in the morning and evening formats respectively. With the approval of competent authority, the admission has been offered in both the formats. The classes are in progress with merger of certain classes for economy of effort. Since, in Karachi the trend is being shifted from evening to weekend, an agenda point has been prepared for ACM to seek permission for this program to be offered in weekend format as well.
- c. The program has the potential and market to grow in times to come.

Discussion

66. Conduct/continuation of 2-years degree program was extensively deliberated. HEC and NCRC guidelines, roadmap limitations, university's role and jurisdiction as well as market demand etc. were all brought under discussion. Divergent views were presented by the participant members.

Decision 35(3316)

67. Finally, the Council resolved that only morning/evening program may be continued while weekend programs may not be offered. Point was dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Concerned HODs	Dean MS
Statutory Documents Affected: -		

Item 3321: Approval of 4.5 Years as Minimum Duration of the Bachelor of Science in Supply Chain Management Program being conducted by the PNSL

Responsibility: Dean MS

Decision of the 34th ACM

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

Progress Reported

69. The program approval is being processed on file with comments from the stakeholders, Alignment with BS (SCM) at Bahria Business School is recommended, for approval along with the MOU.

Discussion

70. Controller of Examinations briefed the house on required regularization of the Program as being conducted at PNSL; comprising of signing Memorandum of Understanding (MoU) between BU and Pakistan Naval Academy (PNA), review of Program roadmap and amendments in BUAC. It was apprised that these aspects had been resolved with Naval Headquarters and consent taken from BU stake holders.

Decision 35(3321)

71. After detailed deliberation on each aspect by the Controller of Examinations, the Council decided that:

- a. A Memorandum of Understating (MoU) should be signed between BU and PNA for conduct of initial 3 x semesters of BS (SCM) 4.5 years at PNA, while following the BU Academic Rules and Examinations Policy.
- b. Roadmap of BS (SCM) 4.5 years Program should be amended retrospectively to affect the following (approved by the Council):
 - i. *Ethics* (Course Code SOC 360) with *Business Ethics* (Course Code SOC 350), for the same 3 CH.
 - ii. *Management* (Course Code MGT 120) with *Introduction to Management* (Course Code MGT 121), for the same 3 Credit Hours.
- c. BU Rules for Retake and Probation/ Chance/ Drop should be amended to allow PN Rules for Supplementary/ Make-up/ Re-examination and Relegation/ Withdrawal respectively, through following new clauses (approved by the Council):
 - i. **7.9.6** Undergraduates of BU academic programs enrolled in CUs administratively and financially under the Naval Headquarters are to follow relevant PN rules for Retakes/ Supplementary/ Make-up/ Re-examinations; duly ratified by BU Academic Council.
 - ii. **7.10.3** Undergraduates of BU academic programs enrolled in CUs administratively and financially under the Naval Headquarters are to follow relevant PN rules for Relegation/ Withdrawal; duly ratified by BU Academic Council.
- d. Ratification of relevant PN Rules for Supplementary/ Make-up/ Re-examination and Relegation/ Withdrawal of under-graduates iaw BUAR 7.9.6 and 7.10.3 (new clauses) is to be pursued in next ACM.

e. The point is to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar Controller of Examinations Principal BBS, BUKC CO PNSL	Dean MS
Statutory Documents Affected: BUAR 2016		

Item 3405: Amendment in Eligibility Criteria of LLM Program

Responsibility: Director BUIC

Decision of the 34th ACM

72. The Council resolved the following:

- a. Amendment in eligibility criteria for LLM program approved in principle as under:
“LLB degree from Pakistan Bar Council (PBC)/HEC recognized university/institute with minimum CGPA of 2.5/4.00 or 50% marks where CGPA is not given”.
- b. Options/strategies w.r.t taking up the case with HEC be proposed on file for formal approval by the Rector.
- c. Point to remain on agenda and progress be reported.

Progress Reported

73. As per para ‘b’ of Item # 3405, the department had acquired the formal approval from Honorable Rector vide file No. BUIC/Law/2020/943 dated 09 January 2020. Thereafter as per the requirement the letter from Registrar Secretariat has also been written to HEC on 06 February 2020. Accordingly, the decision has been implemented wef Fall 2020 admission.

Discussion

74. It was apprised that case has been sent to the HEC for information regarding the ACM approval on the subject amendment.

Decision 35(3405)

75. Point was dropped from ACM agenda.

Item 3411: Modular Teaching at FMDC

Responsibility: Director HS

Decision of the 34th ACM

76. The Council decided that:

- a. Issuance of revised MBBS/BDS Curriculum and Modular Teaching Study Guide to FMDC - Approved.
- b. Adoption of Modular Teaching to be complied by FMDC for batch 2020-21 onward.
- c. Modalities for compliance including training of Faculty to be worked out by Secretary BU Affiliation Committee (DE) with the assistance of DHS.
- d. Point to remain on the agenda and progress be reported.

Progress Reported

77. It was decided that a joint team of BU will visit FMDC to ensure the up gradation and implementation of modular teaching. However due to the pandemic, the visit has been postponed and is being scheduled in 2nd week of August 2020.

Discussion

78. Secretary BU Affiliation Committee (Controller of Exams) updated the house that FMDC had conveyed its readiness for review inspection of its Modular Teaching System by the BU team, which is scheduled on 12-13 August 2020.

Decision 35(3411)

79. The Council decided that progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director HS Secy BU Affiliation Committee	Dean HS
Statutory Documents Affected:		-

Item 3412: To Devise a Uniform Policy for Award of Medals and Merit Certificates to Undergraduate and Postgraduate Students of Semester-based Programs of Health Sciences at BUMDC aligned with Existing Criteria of BU

Responsibility: Dean HS

Decision of the 34th ACM

80. It was decided that proposal of BUMDC be aligned as per Academic Rules in vogue and case be put up on file for processing through Examinations Directorate.

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

Progress Reported

82. Case was pursued by BUMDC through a letter dated 4 December 2019 to Director Examinations BU. While the award of medals/ honours for MPhil programs is being considered as per relevant BU MS/ MPhil Rules, decisions related to DPT, BS MLT and BS Nursing programs are awaited.

Discussion

83. Controller of Examinations briefed the house that award of medals and certificates to all BU Health Sciences programs had been covered in overall review of related BU Rules, being covered as a separate agenda item (3519). He further apprised that BU semester based programs including Health Sciences offer Honour/ Cum Laude Certificates to high achievers, while Merit/ Distinction Certificates are offered in non-semester based (annual/ modular) programs only.

Decision 35(3412)

84. The Council decided to drop the item from ACM agenda as it is covered under new agenda Item # 3519.

Item 3420: Introduction of Islamic Studies Courses for Grooming of Students

Responsibility: Dean MSS

Decision of the 34th ACM

85. The case of implementation of Islamic Studies Courses for BS Programs is to be studied by a Committee of all Deans headed by Dean MSS for preparing a workable implementation plan. The Committee is to obtain input/recommendations of DBOS & FBOS of each faculty and subsequently, implementation plan be processed on file for approval by the Rector before the next ACM.

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

Progress Reported

87. Course is discussed at the department and Faculty level for the BS programs. Which will be taken up for final approval at the ACM. Next ACM for implementation.

Decision 35(3420)

88. The Council decided to drop the item from ACM agenda as same is covered under new agenda Item # 3524.

Item 3421: Approval of New Undergraduate Program - Bachelor of Science in Public Health iaw HEC Curriculum

Responsibility: Dean HS

Decision of the 34th ACM

89. It was decided that BUMDC in coordination with BUKC will forward the proposal once issue of space is resolved.

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

Progress Reported

91. Comprehensive working paper for four years Bachelor of Sciences in Public Health (BSPH) program was presented during 34th ACM (Appendage 3421 page 162 onwards). Due to paucity of space at BUMDC, BUHO directed BUKC and BUIC to make necessary arrangements for the successful launch of subject program and conduct of the courses.

92. The program is being launched in Fall 2020 semester. CBT requirements and course codes have been formulated and sent to BUHO.

Discussion

93. The Honorable Rector enquired whether the program should be under the Health Sciences or Humanities & Social Sciences (HSS). Then this matter was extensively deliberated and roadmap and other associated details were evaluated. It was argued that similar program was not run by any other HEI except the Medical Universities in the country although the curriculum included both medical and social sciences courses. Finally, it was agreed that Dean HS is to provide guidance whereas the ownership of the program is to remain with the CUs.

Decision 35(3421)

94. Bachelor of Science in Public Health program approved by the Council to start at BU Islamabad Campus and BU Karachi Campus wef Fall 2020 intake.
95. Curriculum and Roadmap of Bachelor of Science in Public Health is approved as per attached Appendix 35(3421).
96. Point to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Dean H&SS Dean HS Director BUIC & BUKC	Dean HS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3422: Bachelor of Science in Supply Chain Management - Launch Proposal

Responsibility: HOD (MS) BUKC

Decision of the 34th ACM

97. Launch of Bachelor of Science in Supply Chain Management (04 Years) Program along with roadmap as per Appendix 3422 approved by the Council wef Spring 2020 intake for BU Karachi Campus and Fall 2020 intake for BU Islamabad Campus.

Progress Reported

98. Program was approved in 34th ACM on 23 December 2019, when 1st phase of admission for Spring 2020 was already over. The program was offered during the 2nd phase of admission in the 1st week of January 2020. Due to limited time for advertisement and publicity, the program could attract only 4 students for registration. Therefore, the said program could not be started due to low intake in Spring 2020.

99. The program shall be offered with focused publicity and promotion in Fall 2020; it has the potentials to grow in next 2-3 Semesters.

Discussion

100. Dean MS apprised that the program has been launched at BUIC and BUKC with 27 and 18 applicants respectively. It was desired that this number should increase for success of the program

Decision 35(3422)

101. The Council decided to keep the item on ACM agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD (MS) BUIC & BUKC	Dean MS

Statutory Documents Affected: -

Item 3425: Review of Penalties for Academic Misconduct

Responsibility: Director BUIC

Decision of the 34th ACM

102. The Council decided that a Committee headed by Director BUIC be formed to review and propose suitable recommendations regarding amendment in the relevant provisions of Academic Misconduct Chapter-13 (para 13.10.1 Table 10) of BUAR 2016.

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

Progress Reported

104. A Committee was constituted to review and proposed suitable recommendations regarding amendments in the relevant provisions of Academic Misconduct, Chapter -13 (para 13.10.1 Table 10) of BUAR 2016.

105. The Revised Chapter 13 Clause 13.10.1 and Table 10 are attached as Appendix 35(3425) (page 123).

Discussion

106. Director BUIC explained the rationale behind taking up amendments in existing penalties against Academic Misconduct given in BUAR 2016. During the discussion various connotations of the types of Misconduct were highlighted requiring further deliberation besides input of the Legal Advisor BU.

Decision 35(3425)

107. The Council decided that the proposed amendments may be reviewed and presented separately for approval by the Competent Authority, followed by ratification in next ACM. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director BUIC	Director BUIC
Statutory Documents Affected:	-	

New Items**Item 3501: Addition in Elective Course in LLM & PhD**

Sponsor: HOD (Law) BUIC

Referral Authority: FBOS MS

Summary of the Case

108. Due to the research interests of the faculty and the post graduate students in advanced research areas of human rights the following elective course in LLM and PhD program has been recommended for approval:

Sr.#	Course Code	Course Title	Credit Hours
a.	LLM 757	Business Ethics and Human Rights	3

109. Detailed course description on prescribed format as per attached Appendix 3501 (page 129).

Decision 3501

110. Elective Course namely “Business Ethics and Human Rights” (Course Code LLM 757) containing 03 Credit Hours approved for inclusion in the roadmap of LLM & PhD (Law) programs wef Fall 2020 intake at BUIC.

111. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT HOD Law	Dean H&SS
Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.		

Item 3502: Offering BBA 2 Years on Weekend Format

Sponsor: HOD (MS) BUKC

Referral Authority: FBOS MS

Summary of the Case

112. BBA 2-years was processed in 33rd ACM in light of new HEC policy on students with 14 Years education. The program was approved on morning and evening formats with 76 Credit Hours for students having 14-years education with effect from Fall 2019. In the morning format, it has attracted students, however, the evening format at Karachi has not attracted much interest of the students. The study at the department level suggested offering the same program on weekend format as well.

Financial Effects

113. Positive, as more students would enroll.

Discussion

114. Point was deliberated and mixed views were offered by the members on the proposed weekend format for BBA 2 Years program. The same was already deliberated during discussion on review items.

Decision 3502

115. Proposal regarding conducting BBA 2 Years program on weekend format was not approved by the Council. Point dropped.

Item 3503: Clarification on Summer Courses of BBA 2-Years Program

Sponsor: HOD (MS) BUKC

Referral Authority: FBOS MS

Summary of the Case

116. BBA 2-years was processed in 33rd ACM in the light of new HEC policy on students with 14-years education. The program was approved with 4 regular semesters having 6 courses each and 2 courses in summer semester as per HEC guidelines. Two courses of 2 credit hours each are part

of the roadmap as allowed/approved in the ACM. Therefore, these courses are not liable to grade capping etcetera. For the purpose of clarity and processing in the examination department, it appears appropriate that decision of 33rd ACM be elaborated with an addition statement as: ***conduct of the two course in summer as specified in roadmap of BBA 2 Years approved in 33rd ACM, shall be considered as regular courses without grades capping and without any prejudice to the students' right to honors & medals.***

Discussion

117. It was highlighted that Summer Semester is a part of BBA 2-years program whereas for the remaining programs, Summer is grade improvement semester.

Decision 3503

118. Inclusion of statement “Conduct of two courses in Summer as specified in Roadmap of BBA 2-years shall be considered as regular courses without grade capping and without any prejudice to the students right to Honours and Medals” in the 33rd ACM Decision # 3316 regarding approval of BBA 2-years program approved by the ACM.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Principals BBS/HODs (BS)	Dean MS
Statutory Documents Affected:		-

Item 3504: Suggested Amendments in Existing BU Semester Examination Rules (Summer Session) Regarding Semester-based Health Sciences Programs at BUM&DC Karachi

Sponsor: Vice Principal (BUCPT)

Referral Authority: FBOS HS

Summary of the Case

119. After commencement of DPT program in February 2017 BUCPT implemented BU Semester Examination and Summer Session rules. In implementation of existing semester rules and summer session number of difficulties arise which results in increase drop rate of students due to following reasons:

- a. Under Performed Students do not get any option to improve (if failed or want to improve with > 2.0 CGPA) in summer session because of less than 10 students in course. BU academic rule 3.7.2 does not allow to offer any course to less than 10 students. Some students also need to improve in more than 2 subjects.
- b. Late announcement of result.
- c. If a student is dropped after completing two professional years or more when he or she unable to get CGPA 2.0 in a semester, it will be frustrating for a student to be dropped out without getting any chance to clear subjects.
- d. It will also have negative effect on new intake.

120. To overcome difficulties 2 models are suggested:

a. **Karachi University Model:** In one academic year after two semesters:

- (1) If Student pass 80% subjects promoted to next semester.
- (2) Allowed to clear remaining subjects with upcoming batches.
- (3) If Fail in 80% or more subjects repeat year:
 - i. No Summer Session
 - ii. No Probation, Chance or Drop
- (4) Student gets three chances to clear a subject.

b. **Isra University Model:** In one academic year after two semesters:

- (1) In one academic year after two semesters one supplementary exam held.
- (2) Student who fails in supplementary exam even in one subject will repeat year/semester with payment.
- (3) No Summer Session, No Probation, Chance or Drop.
- (4) Student allow three chances to clear a subject.

c. **Amendments in BU Summer Session:**

- (1) In summer faculty available to BUCPT so this option has no financial impact on BU
- (2) Informal Summer Session with:
 - i. No limit on Number of Students /Course.
 - ii. No limit on Number of Subjects /Student.
 - iii. Relaxation in Duration of summer Session
- (3) Probation, Chance and Drop option may be finished.
- (4) If necessary, apply only in initial 2 years.
- (5) If student improve CGPA then previous status must be cleared. If the same student again drops the CGPA, student will again start with probation rather than carry the previous status.

121. To avoid increase in dropout rate and aligned with other programs in Karachi any of the above suggestions may be approved.

Discussion

122. Vice Principal (BUCPT) Dr Khalid Aziz explained the situation along with background of the case. Models applicable at KU and ISRA University Karachi were also presented. It was highlighted that while following existing semester-based programs of DPT and BS (MLT), BU Drop Rules are more tough and result in excessive failure rate. Later on, Controller of Examinations elaborated that BUMDC semester based programs have Drop out rate similar to other BU semester based programs, and that BU Rules for Probation/ Chance/ Drop have to be followed for all programs for desired quality of education. Nonetheless, relaxation has been given to BUMDC for Summer semesters which can be better availed with appropriate counseling to repeat the failed courses first. DG BUMDC proposed that informal summer session be allowed to DPT/MLT students to create some flexibility without any limitation on minimum number of students /number of subjects.

Decision 3504

123. The Council decided that formal Summer semester may be allowed to students of BUMDC Semester based Programs without minimum number of students' limit. Further, students may be

normally allowed to take 2 x courses in Summer semester with an additional course after the permission by DG BUMDC. All other amendments proposed by BUMDC were not agreed. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean HS/Principal BUMDC	DG BUMDC
Statutory Documents Affected:	-	

Item 3505: Correction in 02 Credit Hours for DPT Program

Sponsor: Vice Principal (BUCPT)

Referral Authority: FBOS HS

Summary of the Case

124. Following correction in 02 credit hours in Unified Course Codes Book for DPT may be amended as under:

Course Code	Course Title	Credit Hours (Booklet)	Correct Credit Hours
PAM 308	Pathology & Microbiology II	2	3 (2-1)
PHA 309	Pharmacology II for DPT	3	2 (2-0)

Discussion

125. During the discussion, it was revealed that suggested amendments are required in the roadmap of DPT:

Decision 3505

126. The Council approved following amendments regarding credit hours in the roadmap of DPT:

For:

Course Code	Course Title	Credit Hours
PAM 308	Pathology & Microbiology-II	2
PHA 309	Pharmacology-II for DPT	3

Read:

Course Code	Course Title	Corrected Credit Hours
PAM 308	Pathology & Microbiology-II	3 (2-1)
PHA 309	Pharmacology-II for DPT	2 (2-0)

127. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Vice Principal BUCPT	Dean HS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3506: Inclusion of Course English-VIII in BS (Nursing) Annual & Semester-based Programs

Sponsor: Principal PNCC

Referral Authority: FBOS HS

Summary of the Case

128. BUHO (Exams Dte) has indicated that subject Course is being taught in BS (Nursing) Program but not included in related curriculum/ roadmap; approved in 32nd ACM. Therefore, English-VIII may be included in Semester-8 of BS (Nursing) curriculum/ roadmap and approval may be accorded as follows:

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours
a.	ENG 415	ENG 416	English-VIII	2

Decision 3506

129. The Council approved following addition in Semester-8 of BS (Nursing) Curriculum/ Roadmap (Annual and Semester-based Programs):

Sr #	Pre-requisite Course Code	Course Code	Course Title	Credit Hours
a.	ENG 415	ENG 416	English VIII	2

130. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Principal PNCC	Dean HS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS, BU Website and amended MoM of 32nd ACM.

Item 3507: Approval of Curriculum and Table of Specifications (TOS) of Family Medicine

Sponsor: Dr Sadaf Haris

Referral Authority: FBOS HS

Summary of the Case

131. It was discussed in DBOS-M that Department of Family Medicine would be launched to teach Family Medicine to 1st & 2nd year MBBS students from 2020, because PMDC has made it mandatory for all medical colleges to have a functional Family Medicine Department with undergraduate teaching of total 100 contact hours. Curriculum & Table of Specifications (TOS) for the course/ subject has been prepared and approved in DBOS-M, which included Primary Care clinics for clinical rotation of 3rd & 4th year students at PNS RAHAT/ Sabir SRE/ Sick Bay. Details of the new course are attached as Appendix 3507 (page 146).

Discussion

132. It was noted that there is no MoU with PNS RAHAT for teaching of BUMDC students. However, Pro-Rector (HS) commented that the same would not be required. Controller of Examinations indicated that inclusion of Family Medicine in MBBS curriculum required approval of amended roadmap, which may be pursued later. Dean HS informed that contact hours of Family Medicine are already embedded in MBBS curriculum; thus, no additional contact hours are being proposed.

Decision 3507

133. The Council approved the recommendations of BUMDC regarding teaching Family Medicine as an exclusive subject in 1st & 2nd Year of MBBS program and starting Primary Care clinics for clinical rotation of 3rd& 4th year MBBS students. Setting up of the Department of Family Medicine at BUMDC was also approved. Point is to remain on agenda and progress be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean HS Director IT	DG BUMDC
Statutory Documents Affected:	Updating of BU Website.	

Item 3508: Establishment of Bahria University Post-Graduate Institute of Health Sciences (BU-PGIHS); Updated Vision, Mission Statement, Terms of references, Objectives, Outcome, Organogram of BU-PGIHS for Deliberation and Approval

Sponsor: Chairperson PG-PTM, BUMDC

Referral Authority: FBOS HS

Summary of the Case

134. Faculty of Health Sciences (FHS) that started with establishment of Bahria University Medical & Dental College in 2009 is growing and now also have College of Physical Therapy, College of Nursing and College of Allied Health Sciences under its umbrella. Postgraduate programs of MPhil Anatomy, MPhil Pathology and MPhil Pharmacology were started in 2017 in Medical College. In coming years addition of programs from all stake holders (Medical, Dental, Physical therapy, Nursing, Public health) of FHS in basic & clinical subjects is expected with horizontal and vertical expansion. This is essential and aligned with the future growth plan and vision 2030 of Bahria University.

135. Establishment of Bahria University Postgraduate Institute of Health Sciences (BU-PGIHS) with dedicated, purpose built premises and with related facilities is therefore proposed by BUMDC. Improved concept paper of Bahria University Postgraduate Institute of Health Sciences (BU-PGIHS) with incorporated suggestions (given by Director QA vide Min-11 of case on file) is approved by DBOS and FBOS. (Inclusive of updated Vision, Mission statement, Terms of references, Objectives, Outcome, Organogram of BU-PGIHS). It is now being submitted to the auspicious forum of ACM for approval. Detail is attached as per Appendage 3508 (page 163).

136. Highly recommended as an essential requirement of future growth plan and vision 2030 of Bahria University and any university of repute to maintain its prestige and status.

Financial Effects

137. Purpose built premises and related facilities are required with Total Surface Area = 24,910 square ft.

138. Expenses required for hiring of subject specialist (if required) as per launch of specific program(s) in future years.

139. Expenses required for hiring of supporting staff and computer literate personals.

Establishment/ HR effects if any

140. Induction of supporting staff and computer literate personals.

141. Expenses required for hiring of subject specialist (if required) as per launch of specific program(s) in future years.

Discussion

142. Pro-Rector (HS) explained the background of the case and its relevance to BU Vision 2030 for BUMDC; proposing an inclusive Postgraduate institute to act as umbrella for Health Sciences PG Programs. However, during extensive deliberation, it was highlighted that for Medical universities and other large HEIs a satellite Campus may need to have a PG Institute, but for BUMDC such an infrastructure was exorbitant, especially when existing PG structure of BU is functioning effectively.

Decision 3508

- 143. a. The Council decided to maintain status quo on the matter, with Dean HS to oversee all HS academics programs and the Chairperson PG to look after HS PG Programs; while the PGIHS may be pursued as a part of BU Vision 2030, along with appropriate roadmap.
- b. It was further decided that henceforth the Colleges of MBBS and BDS programs would be called the Bahria Medical College and Bahria Dental College respectively; replacing shared title of BUMDC.
- c. Point be dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean HS Chairperson PG-PTM, BUMDC	DG BUMDC
Statutory Documents Affected:		

Item 3509: Launch of MPhil (Biochemistry) and MPhil (Physiology) to complete Phase-I of Postgraduate Institute of Health Sciences (BU-PGIHS); Updated Vision, Mission Statement, Objectives, Outcome, Rationale, Roadmap and Curriculum of Respective Programs aligned with Existing MPhil Programs for Approval

Sponsor: Chairperson PG-PTM, BUMDC

Referral Authority: FBOS HS

Summary of the Case

144. Postgraduate degree programs in Medical Health sciences are too many. Therefore, launch of these many programs are divided into phases. In Phase-I launch of MPhil programs in 05 basic Health Sciences subjects (Anatomy, Physiology, Biochemistry, Pharmacology and Pathology– Histopathology & Microbiology) were decided by BUMDC.

145. Three MPhil programs (Anatomy, Pathology and Pharmacology) were started in 2017. Now launch of remaining 02 programs (Biochemistry & Physiology) is proposed by BUMDC to complete Phase-I of basic Health Sciences programs and Post Graduate Institute of Health Sciences (BU-PGIHS).

146. Updated Vision, Mission Statement, Objectives, Outcome, Rationale, Roadmap and Curriculum of respective programs aligned with the existing MPhil programs approved by DBOS and FBOS is submitted for approval.

147. Requirements of regulatory body (PMDC and HEC) needs to be fulfilled to obtain NOC prior to launch of respective programs. Detail is attached as per Appendage 3509 (page 172).

148. Highly recommended to complete Phase-I of postgraduate degree programs of Bahria University Postgraduate Institute of Health Sciences (BU-PGIHS).

Financial Effects

149. Financial effects are as under:

- a. Expenses to hire (01) PhD faculty in Biochemistry & Physiology.
- b. Allocation of more funds to BUMDC to upgrade the library PG- section as per HEC guidelines.
- c. Expenses for hiring animal house facility team (Veterinary doctor, staff).
- d. Expenses for equipment and Phase-2 of animal house facility.

Establishment/ HR effects if any

150. Hiring of (01) PhD faculty in Biochemistry & Physiology.

151. Induction of Veterinary doctor and his staff.

Discussion

152. DG BUMDC explained that in Phase-I, 05 MPhil programs were included and 03 have already been started.

Decision 3509

153. Launch of MPhil (Bio-Chemistry) and MPhil (Bio-Physiology) programs alongwith Roadmaps at Appendage 3509 approved by the Council.

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

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director QA Director IT Dean HS	DG BUMDC

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3510: Approval of Marks Distribution in MPhil Programs (Anatomy, Pharmacology and Pathology)

Sponsor: Chairperson PG-PTM, BUMDC

Referral Authority: FBOS HS

Summary of the Case

155. In Faculty of Health Sciences, 03 MPhil programs (Anatomy, Pathology and Pharmacology) were started in 2017. Formal approval of marks distribution by ACM for these programs was not obtained then. Since results of all BUMDC semester based programs will be processed through CMS from Spring 2020, marks distribution for internal assessment of these programs and future additions in MPhil programs (Biochemistry/ Physiology), approved by FBOS, is submitted as Appendage 3510 (page 241) for endorsement and approval by ACM.

156. Highly recommended to continue, maintain and sustain the standard of postgraduate degree programs at BUMDC.

Discussion

157. It was apprised that marks distribution as proposed for MPhil programs (Anatomy, Pathology and Pharmacology) has been incorporated in CMS, while its formal approval by the Academic Council is awaited.

Decision 3510

158. Marks distribution for BUMDC MPhil Programs (Anatomy, Pathology and Pharmacology) at Appendage 3510 approved by the Academic Council. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director IT Chairperson PG-PTM, BUMDC	Dean HS

Statutory Documents Affected: Updating of CMS.

Item 3511: Revision of MS (Electrical Engineering) Roadmap

Sponsor: HOD (EE) BUIC

Referral Authority: FBOS ES

Summary of the Case

159. MS (Electrical Engineering) Road map was updated in 26th ACM in April, 2016.

160. Existing roadmap of MSEE (Power) and MSEE (Automation & Controls) was suggested to be improved so that the core courses and the electives must be aligned with current industrial/research trends.

161. Embedded System specialization of MSEE is in competition with MS CE program at BUIC. Therefore, it is recommended to discontinue this stream.

162. It was suggested to introduce “Internet of Things” specialization stream in the road map keeping in view large research opportunities in the domain of IoT.

163. During FBOS, the house recommended following:

- a. With available information it was found that not a single student was enrolled in embedded system specialization since its start; moreover, the embedded system is very similar to MS CE program. Therefore, it is recommended to discontinue this specialization.
- b. Rather starting a separate specialization of IoT, the related subjects should be included in the existing specialization of “Communication Systems and Networks” and change the name of specialization to “Communication Systems and IoT Networks”.

164. HODs-EE BUIC & BUKC have accordingly revised the roadmap; details attached as Appendage 3511 (page 242).

Discussion

165. Dean (ES) and HOD (EE) BUKC highlighted the changes and their significance/ reasoning; including keeping Communication System and Networks and additional IoT Networks.

Decision 3511

166. The Council approved the changes in the roadmap of MS (Electrical Engineering) as per Appendage 3511, alongwith renaming the specialization ‘Communication Systems and IoT Networks’ wef Fall 2020. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Principals SEAS BUIC & BUKC	Dean ES
Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.		

Item 3512: Modification of Eligibility Criterion for BS (IT) & BS (CS) Programs

Sponsor: HODs (CS) BUIC, KC & LC

Referral Authority: FBOS ES

Summary of the Case

167. BU eligibility criteria for admission in BS(CS) and BS(IT) Programs is minimum 50% marks in Intermediate (HSSC) examinations with Mathematics, or equivalent qualification with Mathematics certified by IBCC. NCEAC vide its letter no. NCEAC/HEC/General/3-20 dated 20 March 2020 has allowed the students of pre-medical qualification to seek admissions in all Bachelors/ Undergraduate computing programs (CS, SE, IT, AI, DS, CySec). All such students must pass deficiency courses of Mathematics of 6 credit hours within one year of their regular studies. The

deficiency courses should cover most of the relevant topics to bachelor degree in computing education from intermediate level mathematics.

168. In order to increase the pool of applicants in BS(CS) and BS(IT) Programs while availing the provision allowed by NCEAC for Pre Medical applicants, modified eligibility criteria and scheme for registration has been formulated by related BU Departments. Consolidated policy thus prepared is attached as per Appendage 3512 (page 248).

Decision 3512

169. Modified eligibility criteria for admissions in BS (CS) and BS(IT) Programs approved as per Appendage 3512 wef Fall 2020 intake. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director IT HODs CS	Dean ES
Statutory Documents Affected: Updating of BU Website.		

Item 3513: Changes in Elective Courses of BSE Program

Sponsor: HODs (SE) BUIC & KC

Referral Authority: FBOS ES

Summary of the Case

170. Curriculum development is a continuous process. Changes are recommended based on the changing trends in industry and recommendations by the faculty. Accordingly, changes were proposed in existing roadmap of BSE program in terms of addition/ changes in the courses.

171. Dean-ES added that since credit hour configuration of presented course is different, new course code should be proposed and contents should be mentioned.

172. The house suggested few changes which are incorporated. Detail of changes in elective courses BSE is attached as per Appendage 3513 (page 249).

Decision 3513

173. Changes in elective courses of BSE Program as per Appendage 3513 approved wef Fall 2020 semester by the Council. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Principal SEAS BUIC & BUKC	Dean ES
Statutory Documents Affected: Updating of Unified Course Codes Book, Prospectus, CMS and BU Website.		

Item 3514: Revision of Program Educational Objectives (PEOs)

Sponsor: HODs (SE) BUIC & KC

Referral Authority: FBOS ES

Summary of the Case

174. There were few observations made during the PEC visit in Mar 2019 on PEOs of BSE Program. They observed that Program Educational Objectives (PEOs) are rewording of Program Learning Outcomes (PLOs) and there is a mismatch between mapping of PEOs with the University's vision and mission.

175. After detailed discussion refined PEOs and mapping was finalized in FBOS ES. Revised Program Educational Objectives (PEOs) and mapping BSE is attached as per Appendage 3514 (page 251).

Decision 3514

176. Revised Program Educational Objectives (PEOs) and Mapping BSE Program approved by the Council as per Appendage 3514. Point was dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Director IT Principals SEAS BUIC & BUKC	Dean ES
Statutory Documents affected:	Updating of BU Website.	

Item 3515: Enhancement in Result Submission Process & Examination Module in CMS

Sponsor: HOD (SE) BUIC

Referral Authority: FBOS ES

Summary of the Case

177. To enhance to workflow of existing CMS marks entry process, following is recommend:
- HOD should be allowed to unlock specific exam marks entry in CMS before submitting the result to Campus.
 - Such unlocked entries will be sent back to concerned FM and only the FM will be able to update the authorized marks entries.
 - FMs should not be allowed to submit the marks directly to campus or BUHO. The current system treats such submitted results as incomplete results that adds more burden on the examination staff to process such results.
 - Complete log of changes shall be maintained as earlier with email notifications to all concerned and its record in CMS data base.

178. Recommendations were deliberated in FBOS ES. The house emphasized on resolving the issue at departmental level rather accumulating the work for the Campus management, while maintaining the transparency and merit of the system.

Discussion

179. Dean (ES) presented the case along with rationale and reasons for proposed changes in result submission process of CMS. Controller of Examinations highlighted that existing CMS-based results processing system is in place as a result of extensive deliberation with all stake holders through a committee formed exclusively for this purpose; headed by previous Dean ES. It gives adequate provision to the faculty to change the entered result prior submission to the Campus,

where it can still be changed by Director CU if deemed essential. After the result has been submitted to BUHO, it can be changed by the Controller of Exams only, subject to approval by respective DG CU. Since its adoption after approval in 32nd ACM, the requirement to change the result entries by the faculty is gradually reducing. Authorizing such result changes by the HODs was not supported to avoid pressure on the faculty for more frequent changes, as reiterated by DQA and Dean H&SS as well. Therefore, changing the system again is not supported. Rector enquired from BUKC and BULC and both Directors of the CUs expressed satisfaction on the current process, as number of requests for changing result by FMs was within acceptable limits. Director IT commented that considering human error, result submission system needs to be amended in order to protect the students from undue loss. However, as per new organogram, the changes should be finalized by Principals instead of Directors. Routing of result changes by Principals and role of Exams Cell of CUs as a coordinator was also deliberated.

Decision 3515

180. After prolonged deliberations, the Council decided that:

- a. Request for changes in results are to be processed on a Proforma containing written request of the applicant/FM, duly recommended by respective HOD, Principal and approved by respective DG CU. The said changes/amendments will be incorporated by the respective Exams Cells of CUs.
- b. The point may be dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	All Principals Director IT Exams Cells of CUs	DGs of CUs
Statutory Documents Affected:	-	

Item 3516: Introduction of New Bachelor of Science Program in Geosciences (with Specializations: Marine Geology, Marine Geophysics; GIS & Remote Sensing)

Sponsor: HOD (E&ES) BUKC

Referral Authority: FBOS ES

Summary of the Case

181. Geoscience is the study of the Earth - its oceans, atmosphere, rivers and lakes, ice sheets and glaciers, soils, its complex surface, rocky interior, and metallic core. This includes many aspects of how living things, including humans, interact with the Earth. Geoscience has many tools and practices of its own but is intimately linked with the biological, chemical, and physical sciences. It helps to study both terrestrial and marine resources and ecology. Hence, it includes disciplines of Geology, Geomorphology; Geo-environment; Geochemistry; Geophysics; Marine Geology, Marine Geophysics, Marine Ecology and also uses techniques of GIS & Remote Sensing beside modern applications of artificial intelligence (AI) for natural resource explorations, such as oil, gas, mineral, water etc.

182. Currently E&ES Dept. at BUKC offer only one program in Earth sciences, i.e., BS-Geophysics, as compared to BUIC, with a dwindling interest since Fall' 2018. Hence, a new Program "BS-Geosciences with specializations in Marine Geology; Marine Geophysics and GIS" with a broader approach to entice undergraduates with specialization offer during Final Year and by keeping

coastal & marine environment of Southern Pakistan, has been designed. BS Geoscience program was deliberated and received approved from D-BoS (February' 2020) and F-BoS (May'2020). The curriculum and research assignments in new program are further diversified that will enable graduates to tap the professions directly related to their degree around the globe, better than solitary aspect of Geophysics. With forth-coming CPEC projects in Off-shore explorations as well as terrestrial investigations, numerous well-known Government enterprises and private companies search for quality graduates for the oil, gas and mineral exploration & production, hydrogeological studies, environmental monitoring and geological surveys related to off-shore Ecosystem. The geoscience graduates with specializations will have a better scope of finding positions in government, education, and research-oriented job profiles such as: Coastal Geologist; Surveyor; Soil scientist; Remote Sensing Specialist; Groundwater Specialist; Mining or Marine Scientist; Marine Geologist; Petroleum Engineer; Seismologists; Geo-software developers; Geochemist; Geophysicist; Environmental Geologist; Oceanographer; Environmental Consultant; Environmental Lawyer etc.

183. Keeping afore-mentioned into consideration, Department of Earth & Environmental Sciences at Karachi Campus wants to introduce 4 years' undergraduate program titled as "*Bachelor of Science in Geo Sciences*" (*specializations: Marine Geology; Marine Geophysics; GIS & Remote Sensing*) that has already been approved by Board of Studies. The same is presented for your kind approval.

184. Rational & Feasibility, objectives and learning outcomes of a program, eligibility criterion, road map, course details, Faculty & Infrastructure, are attached as per Appendage 3516 (page 253). The program may be approved to be offered at BUKC.

Discussion

185. Dr. Shahid Ali HoD (Geology) Department of BUKC presented the case. The agenda item was extensively deliberated. Various Pros' and cons, prospects and market demand of the newly proposed BS (Geo Sciences) Program were explained.

Decision 3516

186. The Council approved launch of BS (Geosciences) Program at BUKC along with proposed Roadmap as per attached Appendage 3516 wef Spring 2021 intake, with aggressive marketing campaign. Point to remain on agenda and progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT Dean ES Principal SEAS BUKC HOD (E&ES) BUKC	DG BUKC
Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.		

Item 3517: Declaration of Semester Result of PG Students upon Submission of Thesis/ Project Work

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

187. PG students (MS/ M Phil/ MBA) are offered Thesis/ Project Work of 6 Credit Hours during the last semester of their degree Program. However, result of said course is depicted separately in the student's transcript along-with Internship and Community Support Program (CSP), rather than in the relevant semester. By the time the final semester results of these students is declared, their course work is completed, whereas the Thesis/ Project work is incomplete/ in progress as per the permissible timeframe for Thesis Defence/Result Submission as per BU Rules. As such, result of such students should be declared after the completion of Thesis submission time. However, as per current practice, result of such students is promulgated as part of standard semester result declaration. Consequently, the weak students who are already on 'Chance' in the previous semester get 'Dropped' from the Program in case of CGPA less than 2.5 despite the fact that they may secure overall CGPA \geq 2.5 and qualify the degree Program after completion/ acceptance of their Thesis.

188. The above stated issue has been addressed through a standard Policy to declare the semester result of MS/ MPhil/ MBA students upon submission of respective Thesis/ Project Work, and to count the CGPA of 'Dropped' students on the basis of course work only (less than 2.5) in conjunction with respective Thesis/ Project Result for qualifying their degree programs, approved by the honorable Rector and promulgated for its adoption with immediate effect on 23 June 2020.

189. Ratification of amended Final Transcript Format attached as per Appendage 3517 (page 292) is solicited from BU Academic Council.

Decision 3517

190. Amended Final Transcript Format as per Appendage 3517 was ratified by the Council. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations	Controller of Examinations
Statutory Documents Affected:	-	

Item 3518: Merging of BU Affiliation Committee and Technical Evaluation Committee

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

191. BU Affiliation Policy was formulated in 2008 and revised in March 2017. As contained therein, processing of affiliation cases undertaken by the Affiliation Committee headed by Rector. While revising the Policy in 2017, a Technical Evaluation Committee was also formed under the Pro-Rector to visit the applicant institution(s) and assess the viability for affiliation with BU. While BU Affiliation cases were being processed through these two Committees, merger of the both Committees with revised composition was proposed due to the following reasons:

- a. Affiliation Committee headed by the Rector has the mandate of evaluating the affiliation applications, but does not include the Pro Rector who is otherwise involved in on-ground evaluation as head of the Technical Evaluation Committee.
- b. Affiliation Committee has to submit its recommendations to the BoG, without a need to process it first through BU Academic Council. However, all academic matters are generally routed through BU Academic Council. In case the same is adopted for affiliation cases, chairmanship of Affiliation Committee can be downgraded to the Pro-Rector level, as Rector is already heading the Academic Council.
- c. DQA is an important organ of BU to assess the viability of any institution for affiliation with the University. However, he is not included in Technical Evaluation Committee formed for this purpose.
- d. Director R&D/ Director ORIC has a domain pertinent to the working of an institution beyond its basic scope, and may not be a member of the affiliation process. Being a member of the Academic Council, he remains involved in affiliation cases when processed through the ACM.
- e. Owing to the change of nomenclature of some posts as part of reorganization of BUHO, titles of some Committee members need to be amended.
- f. With the limited work of affiliation cases, keeping two Committees for required processing leads to duplication of work that can be avoided by merging the two Committees.

192. The recommendations were approved by the honorable Rector, subject to ratification by the BU Academic Council, with revised composition as under:

a. Rector	-	Chairman
b. Pro-Rector (Academics)	-	Deputy Chairman
c. Dean of concerned Faculty	-	Member
d. Registrar	-	Member
e. Treasurer	-	Member
f. Controller of Examinations	-	Secretary/ Member
g. Director Academics	-	Member
h. Director Quality Assurance	-	Member
j. Director Health Sciences	-	Member (for HS related cases only)
k. Subject Specialist(s)	-	Co-Opted Member(s)

193. It was further approved that all Affiliation cases including the visits/ inspection of applying/ affiliated institutions will be undertaken by the Affiliation Committee, while the Affiliation/De-Affiliation decisions would be processed for BOG approval through the BU Academic Council.

Decision 3518

194. Revised Composition of BU Affiliation Committee tabulated at para 192 above was ratified by the Council, along with processing methodology contained in para 193 above. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations	Controller of Examinations
Statutory Documents Affected: Amendment in BU Affiliation Policy		

Item 3519: Amendment in BU Academic Rules Chapter 9 and Table 2 (Chapter 3)

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

195. Chapter 9 of BU Academics Rules covers the conditions/criteria for Honours and Awards to high achiever graduates; comprising of medals and certificates. While the Rules are being revised/ updated from time to time, following shortcoming in ensuing paragraphs have been noted and revised:

- a. Baseline criteria (current clause 9.2) has been segregated in terms of *Eligibility Criteria* (revised clause 9.2) and *Ineligibility Criteria* (revised clause 9.3).
- b. Conditions for Medals (current clause 9.3) have been further elaborated in terms of the *Semester Based Programs* (revised clause 9.4.2) and *Annual Programs* (revised clause 9.4.3).
- c. Additional time given for completion of some programs, contained in MBA/ MS/ M.Phil Rules but presently not mentioned in BUAR Chapter 9, have also been included.

196. Further to the above, timelines for BU academic programs contained in Table 2 of BUAR Chapter 3 did not include the MBBS, BDS and DPT programs. These have now been covered in revised Table 2 of BUAR Chapter 3.

197. Revised Chapter 9 and Table 2 (Chapter 3) of BUAR attached as presented may be approved by BU Academic Council.

Decision 3519

198. Amendments proposed through Revised Draft of Chapter 9 and Table 2 (Chapter 3) were approved by the Council with some changes, as finalized at Appendage 3519; for subsequent ratification by the Executive Committee. Point to be dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Academics	Controller of Examinations
Statutory Documents Affected: Updating of BU Academic Rules, Students Handbook and BU Website.		

Item 3520: Inclusion of New Course “Foreign Policy of United States” in MS (IR) as an Elective

Sponsor: HOD (H&SS) BUIC

Referral Authority: FBOS H&SS

Summary of the Case

199. The US foreign policy is one of the most significant courses of International Relations. The inclusion of this course would help the students to enhance their understanding about the US foreign policy. Furthermore, it would support the students to develop their areas of expertise in the domain of US foreign policy.

200. The course of “Foreign Policy of United States” may please be approved to be included in the electives list of MS (IR).

201. The course outline for the course “Foreign Policy of United States” is attached as Appendage 3520 (page 296).

Decision 3520

202. Elective Course namely “Foreign Policy of the United States” was approved for MS (IR) Program wef Fall 2020 intake as per Appendage 3520. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT HOD H&SS	Dean H&SS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3521: Replacement of Compulsory Courses as Elective Course “Foreign Policy Analysis & Seminar on Regional and Global Contemporary Issues” and inclusion of New Compulsory Course “Traditional and Non-Traditional Security Paradigms” in MS (IR) roadmap

Sponsor: HOD (H&SS) BUIC

Referral Authority: FBOS H&SS

Summary of the Case

203. HEC in its 2018 NCRC meeting revised the MS (IR) curriculum and changed the status of “**Foreign Policy Analysis & Seminar on Regional and Global Contemporary Issues**” from compulsory to optional courses and included a new course “**Traditional and Non-traditional Security Paradigms**” as compulsory.

204. The status of “**Foreign Policy Analysis & Seminar on Regional and Global Contemporary Issues**” courses may please be changed from compulsory to elective and “**Traditional and Non-traditional Security Paradigms**” be included as compulsory.

205. Relevant material is attached as Appendage 3521 (page 298).

Decision 3521

206. The Council decided the following:

- a. Change of status of two courses namely “**Foreign Policy Analysis & Seminar on Regional and Global Contemporary Issues**” from compulsory to elective, approved by the Council in MS (IR) roadmap wef Fall 2020 intake.
- b. Another course namely “**Traditional and Non-traditional Security Paradigms**” also approved by the Council in MS (IR) Roadmap as compulsory subject wef Fall 2020 intake as per Appendage 3521.

c. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT HOD H&SS	Dean H&SS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3522: Inclusion of new course “Nuclear Security and Non-Proliferation” as Elective in BSS (IR) Roadmap

Sponsor: HOD (H&SS) BUIC

Referral Authority: FBOS H&SS

Summary of the Case

207. Nuclear security is one of the major areas of concern within the discourse of International Relations. Since Pakistan is one of the nuclear powers in the world, our students need to have better and in-depth understanding of nuclear security. CAC meeting has endorsed this.

208. Course Nuclear Security and Non-Proliferation be included into the BSS (IR) Roadmap wef Fall 2020.

209. Course outline for the course “Nuclear Security and Non-Proliferation” is attached as Appendix 3522 (page 302).

Discussion

210. Sensitivity of the contents of the course “Nuclear Security and Non-Proliferation” was deliberated.

Decision 3522

211. The Council approved inclusion of “Nuclear Security and Non-Proliferation” course in BSS (IR) Roadmap wef Fall 2020 intake. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT HOD H&SS	Dean H&SS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3523: Change in Admission Criteria of MS-IR

Sponsor: HOD (H&SS) BUIC

Referral Authority: FBOS H&SS

Summary of the Case

212. To get admission in MS-IR, there are certain subjects that qualify the student to get enrolled in the program. To make it more IR centric, the department intends to include pre-requisite subjects of Peace and Conflict Studies, Strategic Studies, Political Science instead of **Behavioural Sciences**. This will allow the students with specialized courses of IR to pursue their Masters. It will also give more focus of the faculty to the advanced study instead of teaching basics to new students.

213. The above listed subjects may please be approved to be added in the criteria subjects.

Discussion

214. The Council members deliberated the proposal regarding change in admission criteria of MS (IR). It was ascertained that the same was not a deficiency course, instead it is an entry level requirement.

Decision 3523

215. The proposal regarding change in admission criteria of MS (IR) was not agreed by the Council. Point dropped.

Item 3524: Revised Course Outline of Islamic Studies for Undergraduate Programs

Sponsor: HOD (H&SS) BUIC

Referral Authority: FBOS H&SS

Summary of the Case

216. In the light of the Decisions of 42nd BOG meeting of BU it was directed that Center of Islamic studies revise and update the Islamic studies course content for undergraduate programs. It has been modified and revised keeping in view the contemporary requirements.

217. The Revised Course Outline of Islamic Studies (03 Credit Hour) and (02 Credit Hours) may please be approved instead of disturbing the roadmap and any financial impact on the part of students.

218. Revised Course Outline of (03 Credit Hour) and (02 Credit Hours) is attached as Appendix 3524 (page 306).

Decision 3524

219. The Council approved the reviewed Course Outline of "Islamic Studies" of 3 and 2 Credit Hours wef Fall 2020 intake as per Appendix 3524 for Undergraduate Programs at BU. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Admissions Director Academics Director IT HODs H&SS	Dean H&SS

Statutory Documents Affected: Updating of CCH, Prospectus, CMS and BU Website.

Item 3525: Weightage Criteria/Formula for all UG Programs

Sponsor: Director Admissions

Referral Authority: File

Summary of the Case

220. In order to improve the quality of admission intake, the case was processed on file to increase weightage criteria/ formula for all UG Programs; approved by the Honorable Rector on file and intend to promulgated for implementation wef Fall 2020 Semester. Final merit list for admission is prepared on the basis of percentage of CBT test result, HSSC and SSC result for UG programs. The policy is hereby submitted for ratification by the Academic Council. The existing and new weightage criteria/formula for UG programs is as follows:

a. Existing Weightage Criteria

BU Admission Test/ETS Score: 50%, HSSC: 40%, SSC: 10%.

b. New weightage Criteria

BU Admission Test/ETS Score: 60%, HSSC: 30%, SSC: 10%.

c. Statutory Effect(s) if any

Amendment of BU Academic Rule 2.1.3 and Admission Policy clause 2.11.3.

Decision 3525

221. The Council decided that:

- a. New Weightage Criteria/ Formula for all UG Programs, already approved by Rector BU was ratified by the Council for implementation wef Fall 2020.
- b. Point to be ratified from Executive Committee.

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar Director Admissions Director Academics Director IT All Deans/Principals/HODs	Director Admissions

Statutory Documents Affected: Updating of BU Academic Rules, Admission Policy, Prospectus and BU Website.

Item 3526: Increase in CBTs Passing Marks from 33% to 40%

Sponsor: Director Admissions

Referral Authority: File

Summary of the Case

222. In order to improve the quality of admission intake, the case was processed on file to increase CBTs passing marks from 33% to 40%. Moreover, the case was also forwarded to all Campuses for their valuable feedback. The Honorable Rector approved on file that increase in CBT passing marks be discussed in ACM and the same be implemented wef Fall 2020 Semester. The policy is hereby submitted for approval by the Academic Council.

Decision 3526

223. After detailed deliberation, the Council has decided to maintain the status quo on the subject. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision		Director Admissions
Statutory Documents Affected:	-	

Item 3527: Re-Constitution of Standing Committee for Award of Medals at Convocations

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

224. Gold/ Silver medals are awarded to BU graduates in each convocation, based on the criteria contained in BU Academic Rules Chapter 9 (Honours and Awards). While the approval for the recipients is taken on file from the honorable Rector, the nominees are finalized by the Standing Committee. Composition and TOR of this Committee have been reviewed, but the Committee has not been included in the list of Standing Committees contained in BU Academic Regulations (Standing Committees at the University Level).

225. Further to the above, said Standing Committee is presently headed by the Registrar, with the Director Post Graduate Programs as its Member. With the re-organization of BUHO and empowerment of the Pro-Rectors, it is considered appropriate to re-constitute the Standing Committee for Award of Gold and Silver Medals as under, while changing its title to the Honours and Awards Committee:

- | | |
|-------------------------------|--|
| a. Pro-Rector (Academics) | - Chairman |
| b. Registrar | - Member |
| c. Controller of Examinations | - Member/ Secretary |
| d. Director Academics | - Member |
| e. Director Health Sciences | - Member (for Health Sciences students only) |
| f. Director Quality Assurance | - Member |
| g. Concerned Director CU | - Member |
| h. Concerned Principal(s) | - Member(s) |
| i. Concerned HoDs | - Co-Opted Members |

226. Based on the above stated, the following is recommended:

- Standing Committee for Award of Gold and Silver Medals may be re-constituted and re-titled as proposed at para 225 (a. to i.) above.
- The Standing Committee along with its TOR may be included in BU Academics Regulations Chapter 2, with endorsement in BU Academic Rules Chapter 9; attached as Appendage 3527 (page 314).
- Statutory Effect(s) if any.** Addition in BU Academic Regulations Chapter 2 and BU Academic Rules Chapter 9.

Discussion

227. Controller of Examinations briefed the house on the proposal and highlighted that subsequent to the approval by the Council, ratification of the amendments in BU Academic Regulations Chapter 2 and BU Academic Rules Chapter 9 will be pursued from BU Executive Committee.

Decision 3527

228. The Council approved the proposed composition of Honours and Awards Committee, as listed at para 225 above, along with amendments at Appendix 3527, for adoption and subsequent ratification by BU Executive Committee.

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar Controller of Examinations	Controller of Examinations
Statutory Documents Affected: Updating of BU Academic Regulations.		

Item 3528: Amendment of BU Academic Rules 7.14.1 and 7.14.2

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

229. Following instructions for disposal of answer sheets are contained in BU Academic Rules 2016 (Clause 7.14.1-2), which are replicated in BU Students Handbook:

7.14.1 Answer books shall be retained for 12 months, to be destroyed thereafter by burning, by a destruction committee to be nominated by the Head of the CU.

7.14.2 Answer sheets pertaining to court cases shall be retained until disposal of cases.

7.14.3 Students shall be informed that no request concerning answer sheets shall be entertained subsequent to three months after the examination.

230. Solved answer sheets are code numbered and do not carry the student's name. Therefore, selling the answer sheets for recycling is an appropriate option; adopted by BUHO (Exams Dte) in 2019 for MBBS/ BDS answer sheets. SOP for retention/ disposal of answer sheets has also been verified from PNEC-NUST Karachi and the Air University Islamabad. Both these Universities retain the answer sheets for 12 months (1 year) after the announcement of results. Thereafter, PNEC-NUST burns these records while the Air University earlier disposed off the answer sheets by burning but has lately adopted selling them out for recycling.

231. Above in view, BU Academic Rule 7.14.1 and 7.14.2 were proposed to be amended to include the option of recycling along with burning, as indicated below:

7.14.1 Answer books shall be retained for 12 months, to be destroyed thereafter through burning/**recycling (outsourced)** by a Destruction Committee to be nominated by the Head of the CU/ **Controller of Examinations**.

7.14.2 Answer sheets pertaining to court cases/**pending complaints** shall be retained until disposal of respective cases.

232. Proposed amendments have been approved by the honorable Rector subject to ratification by BU Academic Council.

Decision 3528

233. After further discussion, proposed amendment in BUAR 7.14.1 and 7.14.2 (para 231 above) were ratified by the Council. The same may be presented in ECM for ratification.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director Academics Exam Cells of CUs	Controller of Examinations
Statutory Documents Affected: Updating of BU Academic Rules and Students Handbook.		

Item 3529: Depicting of Deficient Courses in Students' Transcript

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

234. BU students deficient in any prerequisite course are admitted in Postgraduate programs subject to subsequently qualifying related courses in accordance with HEC guidelines and ACM Decision 3224. However, such courses are neither depicted in their Transcript nor exclusively monitored in CMS record/ Exams Dte database. The same can be resolved through following:

- a. As an immediate measure, deficient course(s) of such students may be depicted through manual entry in BUHO (Exams Dte) Database, for depiction of deficient courses as indicated on amended Final Transcript at Appendix 3529.
- b. As a long term measure, a new CMS module for deficient courses may be developed by IT Dte, to upload the relevant information at the time of admissions at respective CU.

235. The above stated has been approved by honorable Rector subject to ratification by BU Academic Council.

Discussion

236. Controller of Examinations briefed the house on stated requirement, while presenting the amended Final Transcript.

Decision 3529

237. The Council ratified the measures approved by the Rector along with amended Final Transcript at Appendix 3529. Point dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Controller of Examinations Director IT	Controller of Examinations
Statutory Documents Affected: -		

Item 3530: Establishment of BU Schools at BUIC & BUKC

Sponsor: Registrar

Referral Authority: Case File

Summary of the Case

238. Following Schools have been established at BUIC & BUKC (Details are attached as Appendix 3530 (page 316):

- a. Bahria Business School (BBS)
- b. Bahria School of Engineering and Applied Sciences (BSEAS)
- c. Bahria Humanities & Social Sciences School (BH3S)

239. Establishment of above schools at BUIC & BUKC is placed for ratification by the Council.

Discussion

240. DQA and Deputy Registrar proposed the establishment of Schools, notified by the Registrar that the same is necessary for processing final endorsement by the accreditation bodies; subject to ratification by the Council.

Decision 3530

241. Establishment of Bahria Business School (BBS), Bahria School of Engineering & Applied Sciences (BSEAS) and Bahria Humanities and Social Sciences School (BH3S) was approved/ratified by the Council. Point dropped, while Executive Committee ratification may be pursued (if required).

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar	Registrar
Statutory Documents Affected:		Updating of BU Website.

Closing the Meeting

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

1 st Progress Report on Action Items of 35 th ACM	25 September 2020
2 nd Progress Report on Action Items of 35 th ACM	23 October 2020
Agenda Items for the 36 th ACM	23 October 2020
Schedule of 36 th ACM	17 & 18 November 2020 (Tentative)

243. The Secretary appreciated the efforts and contributions of ex-Secretary, Capt Zahid Majeed PN (Retd) in conduct of 34th ACM.

244. The Chair thanked the participants for focused discussion and productive deliberations during the meeting.

DR. RIAZ AHMED
Secy Academic Council

Dated: 26 August 2020

STUDY REPORT - FEE STRUCTURE COMPARISON & SCHOLARSHIPS/DISCOUNTS BEING OFFERED BY UNIVERSITIES AT LAHORE

1. Lahore being an educational hub with large number of degree awarding HEIs (approx. 90 in number) both in public and private sector offer admission opportunities with a package of hefty discounts and allied facilities. List of HEC recognized main universities located in Lahore is attached at **Annex A**.
2. Furthermore, vibrant campuses of well recognized and established institutions are located in the close proximity of BULC. Out of the universities mentioned at Annex A, 7 universities are in proximity of BU Lahore Campus i.e; within a range of 6 KMs. The details of these Universities are as follows:

S.No.	University	Inception (Year)
a.	University of Management & Technology(UMT)	1990
b.	University of Central Punjab (UCP)	1999
c.	University of Lahore (UOL)	1999
d.	FAST University	1999
e.	COMSATS	2002
f.	Superior University	2008
g.	Riphah International University (RIU)	2012

3. In 34th ACM under Review Agenda Item 2234, it was discussed that fee structure of BU needs to be evaluated w.r.t attracting large number of students in forthcoming intakes. Accordingly, a detailed study of HEI's in close proximity of Bahria University Lahore Campus has been conducted based on fee comparisons, allied facilities, scholarships, fee waivers and discounts being offered to attract admission intake.

4. **Fee Comparison.** Detailed Fee Structure of compared universities is attached at **Annex B**. Although fee structure of other universities is much higher as compared to BULC but they are offering variety of scholarships/discounts/ fee waivers in 1st semester to attract maximum students at the time of admissions. Salient features of other universities are as follows:

- a. A variety of scholarships, discounts and fee waivers ranging from 20% to 100%.
- b. A range of Alumni Discounts.
- c. Kinship fee discounts.
- d. Sports based fee discounts.
- e. Nurseries for University Admission Intake.

5. The detailed study of compared universities scholarships, discounts & fee waiver policies is attached as follows:

a. UMT	Annex C
b. UCP	Annex D
c. Riphah International University	Annex E
d. COMSATS University	Annex F
e. University of South Asia	Annex G
f. Superior University	Annex H
g. University of Lahore	Annex J

6. Summary of all Scholarships and allied facilities being offered by compared universities is attached at **Annex K**.

7. **Observations/ Comments.** Observations/comments on the Admission procedures/scholarships offered by other compared universities and BULC are as under:

- a. Universities at Lahore have large campuses to attract students and their parents as well. They offer various facilities like campus life, sitting & play areas, cafeteria, gym, pool etc. and lot of extra-curricular activities. As Campus life is one of the decisive criteria for students while making a decision to join HEI for higher studies, BULC lack in attracting bulk of students.
- b. The Universities are offering a large variety of scholarships, fee waivers, alumni waivers, corporate discounts, kinships/siblings/sports discounts and group concessions at the time of admissions to attract the potential candidates whereas BULC does not offer such discounts. New scholarships and discount policies if offered like other universities, to cater for new and existing students will contribute positively not only in future admissions but will also help BULC in strengthening academia-industry linkages.
- c. The admissions at BULC are held in two phases to meet the requirement of the community but still there is a gap of around 1 month between closing date of BULC admissions and other public and private sector universities of Lahore which keep admission open after closing of Admissions at BULC.
- d. It has also been observed that students from other cities that constitute 49% of the students strength, want to transfer from Lahore to Islamabad campus or other universities as they face difficulties to manage accommodation and transportation, especially in case of female students.

8. **Conclusion.** The study shows that all compared universities are offering degree programs with higher fee structure as compared to Bahria University. However, they are also presenting market competitive full package of facilities to attract maximum students. All the compared universities have well-established and renowned campuses offer a range of market attractive discounts that attract students and their parents as well.

9. **Recommendations.** Based on the comparative analysis of different universities, following courses of action are recommended to be undertaken to increase the intake of students at BULC:

- a. New purpose built Campus at Lahore may be established at the earliest to attract students and community in Lahore.

- b. BU scholarship policies may be rationalized/made market competitive to attract students by offering fee waivers/kinship/group & sports based discounts without any additional financial allocation.
- c. Alumni waiver of admission fee may also be extended to MBA Programs in addition to MS, MPhil & PhD to attract BU graduates of BBA program to get enrolled in MBA Program.
- d. Corporate discounts to 2 or more candidates joining from any of the national and multinational companies may be offered for Masters Programs (MBA, MS/MPhil & PhD). It will also create a link between industry and university for placements and internship of BU students.
- e. The Admissions may be conducted in two Phases at BU Lahore Campus as per procedure in vogue.

REFERENCES

- <https://admissions.umt.edu.pk/fee.aspx>
- <https://www.ucp.edu.pk/admissions/fee-structure/>
- <https://www.uol.edu.pk/feeguide>
- <http://superior.edu.pk/fee-structure-of-superior/>
- https://usa.edu.pk/admissions/#fee_structure
- <http://nu.edu.pk/Admissions/FeeStructure>
- <https://lahore.comsats.edu.pk/default.aspx>
- [Telephonic conversations](#)

LIST OF HEC RECOGNIZED MAJOR UNIVERSITIES LOCATED IN LAHORE

Public Sector Universities

- COMSATS Institute of Information Technology
- Government College University
- Information Technology University
- Kinnaird College for Women
- Lahore College for Women University
- National College of Arts
- University of Education
- University of Engineering and Technology
- University of the Punjab
- Virtual University of Pakistan

Private Sector Universities

- The Superior University
- University of Central Punjab
- University of Lahore
- University of Management and Technology
- University of South Asia
- Beaconhouse National University
- Forman Christian College
- Global Institute Lahore
- Hajvery University
- Institute of Management Sciences
- Lahore Garrison University
- Lahore Leads University
- Lahore School of Economics
- Lahore University of Management Sciences
- Minhaj University
- National College of Business Administration & Economics
- National University of Computer and Emerging Sciences
- National University of Modern Languages
- Nur International University Lahore- Fatima Memorial System
- Qarshi University
- Infinity School of Engineering Lahore
- University of Sargodha Lahore

FEE / SCHOLARSHIPS/DISCOUNTS COMPARISON

S. No.	UG Programs	Universities with Fee Structure								
		BULC	UMT	UCP	UOL	*FAST	**COMSATS	RIPHAH	USA (Per semester)	Superior
1	BSCS	719,400	1,350,000	1,316,500	1,026,000	1,259,000	114, 500 (same fee for all UG programs)	500,000	1,600,000	931,000
2	BSIT	639,600	1,099,000	Not Offering	Not Offering	Not Offering		Not Offering	1,600,000	931000
3	BBA (4yrs.)	837,000	1,499,000	1,159,000	1,009,000	1,259,000		565,000	1,600,000	931,000
4	BBA (2yrs.)	465,000	Not Offering	Not Offering	535,000	Not Offering		Not Offering	Not Offering	Not Offering
5	BS(PSY)	714,600	799,000	790,000	Not Offering	Not Offering		406,000	Not Offering	Not Offering
6	MSCS	263,145	449,000	340,000	312,500	299,000	78,500	305,000	200,000	381,000
7	MBA(1.5)	256,340	599,000 (M/E)	Not Offering	Not Offering	—		Not Offering	200,000	287,000
8	MBA(2.0)	394,900	799,000 (E)	371,500	395,000	515,000		350,000 (E/W)	200,000	502,000 (E/W)
9	MS(PM)	289,000	450,000	Not Offering	318,000	Not Offering	78,500	220,000	Not Offering	Not Offering
10	MS(MS)	239,950	499,000	Not Offering	312,000	275,000	78,500	210,000	200,000	Not Offering

11	PhD(MS)	400,510	599,000	214,000	502,000	467,000	84,200	Not Offering	Not Offering	Not Offering
----	---------	---------	---------	---------	---------	---------	--------	--------------	--------------	--------------

* FAST has mentioned only per credit hour fee for each program (8,500 for UG & Rs.8,000/- for PG Programs), fee calculated as per BU Credit Hours for each program.

** COMSATS has mentioned only 1st semester fee without mentioning Credit Hours or per credit hour rate, therefore 1st semester fee is mentioned here.

Discounts / Scholarships of other institutions includes Merit Based, Financial Based, Kinship, Alumni, Teachers referrals, Corporate Sector, Special Scholarships (for special colleges, organizations).

MS Fee Structure - UCP, UMT wrt BULC

Sr. No	Universities	PG Programs	Total Fee (Rs.)
1	UCP	MBA (2.0)	371500
2	UMT	Professional MBA (1.5) E	599000
		Professional MBA (2.0) E	799000
		MBA (1.5) M	599000
3	BULC	MBA (1.5)	246800
		MBA (2.0)	379000

FEE / SCHOLARSHIPS/DISCOUNTS COMPARISON

Sr. No.	PG Programs	Universities with Fee Structure						
		BULC	UMT	UCP	UOL	RIPHAH	USA (Per semester)	Superior
1	MSCS	263,145	449,000	340,000	312,500	305,000	200,000	381,000
2	MBA(1.5)	256,340	599,000 (M/E)	-	-	-	200,000	287,000
3	MBA(2.0)	394,900	799,000 (E)	371,500	395,000	350,000 (E/W)	200,000	502,000 (E/W)
4	MS(PM)	289,000	450,000	-	318,000	220,000	-	-
5	MS(MS)	239,950	499,000	-	312,000	210,000	200,000	-
6	PhD(MS)	400,510	599,000	214,000 research work fee=Total 340,000	502,000	-	-	-

FEE / SCHOLARSHIPS/DISCOUNTS COMPARISON

S.No	University Name	Programs	Degree Fee	Avg. Discount (%age)	Avg. Scholarship	Fee after Discount	Fee after Scholarship	Transport Facility	Hostel Facility
1	UMT	BSCS	1,350,000	50%	60%	675,000	540,000	YES (with fee)	Outsource
		BSIT	1,099,000	50%	60%	549500	439,600	YES (with fee)	Outsource
		BBA (4yrs.)	1,499,000	50%	60%	749500	599,600	YES (with fee)	Outsource
		BBA (2yrs.)	—	—	—	—	—	—	—
		BS(PSY)	799,000	50%	60%	399500	319,600	YES (with fee)	Outsource
2	UCP	BSCS	1,316,500	35%	60%	855,725	526,600	YES (with fee)	YES
		BSIT	—	—	—	—	—	—	—
		BBA (4yrs.)	1,159,000	35%	60%	753,350	463,600	YES (with fee)	YES
		BBA (2yrs.)	—	—	—	—	—	—	—
		BS(PSY)	790,000	35%	60%	513,500	316,000	YES (with fee)	YES

3	UOL	BSCS	1,026,000	There is no open policy for Scholarships/Discounts. They have mentioned headings only on website like Sports Based Admissions/Discounts Policy for Alumni. They offer discounts/scholarships on case to case bases.				YES (with fee)	YES
		BSIT	—					—	—
		BBA (4yrs.)	1,009,000					YES (with fee)	YES
		BBA (2yrs.)	535,000					YES (with fee)	YES
		BS(PSY)	—					—	—
4	RIU	BSCS	500,000	30%	50%	350,000	250,000	YES (FREE)	YES for girls
		BSIT	—	—	—	—	—	—	—
		BBA (4yrs.)	565,000	30%	50%	395,500	282,500	YES (FREE)	YES for girls
		BBA (2yrs.)	—	—	—	—	—	—	—
		BS(PSY)	406,000	30%	50%	284,200	203,000	YES (FREE)	YES for girls
5	USA	BSCS	1,600,000	30%	50%	1,120,000	800,000	Nil	YES for girls
		BSIT	1,600,000	—	—	—	—	—	YES for girls
		BBA (4yrs.)	1,600,000	30%	50%	1,120,000	800,000	Nil	YES for girls
		BBA (2yrs.)	—	—	—	—	—	—	—
		BS(PSY)	—	—	—	—	—	—	—

6	Superior University	BSCS	931,000	35%	35%	605,150	605,150	YES (FREE)	YES for girls
		BSIT	931000	35%	35%	605,150	605,150	YES (FREE)	YES for girls
		BBA (4yrs.)	931,000	35%	35%	605,150	605,150	YES (FREE)	YES for girls
		BBA (2yrs.)	–	–	–	–	–	–	–
		BS(PSY)	–	–	–	–	–	–	–
7	BU	BSCS	719,400	50%	40%	359,700	431,640	Nil	Nil
		BSIT	639,600	50%	40%	319,800	383,760	Nil	Nil
		BBA (4yrs.)	837,000	50%	40%	418,500	502,200	Nil	Nil
		BBA (2yrs.)	465,000	50%	40%	232,500	279,000	Nil	Nil
		BS(PSY)	714,600	50%	40%	357,300	428,760	Nil	Nil

Discounts / Scholarships of other institutions included Merit Based, Financial Based, Kinship, Alumni, Teachers referrals, Corporate Sector, Special Scholarships (for special colleges, organizations)

Appendage 35(2334)**COMMITTEE REPORT****ACM AGENDA 34(2334) HEURISTIC AND FLIPPED CLASSROOM METHODS OF TEACHING
AND EVALUATION**

With reference to minutes of the 34th ACM Agenda item 34(2334) following committee was Constituted through the Registrar Office Order No.001/2020 dated 07 January 2020.

- | | |
|----------------------|----------|
| a. DG Karachi Campus | Convener |
| b. Dean M&SS | Member |
| c. Dean ES | Member |
| d. Dean Psychology | Member |

The committee was mandated to prepare and submit before next ACM, a complete Roadmap for implementation of Flipped Class Method of teaching along With incorporation of assessment examination methodology and IT support.

BACKGROUND

1. The matter under reference was initiated by the decision of the 23rd Academic Council Meeting against the Agenda Item # 2334. Through the said agenda item, BBA and MBA Curricula were sought to be revised in line with the Heuristic Method or teaching through incorporating among them optimum use of case studies, exercises, role plays, group activities, movie clips, simulations, journal article reviews and frequent Presentations. Likewise, the evaluation techniques were also sought to be revised to bring them in line with the teaching method. The aim was to make the teaching methodology student-centered that transforms the students to a discoverer-finding out themselves instead of being merely taught and told about things, and makes them more thoughtful, Diligent observer, and independent problem solver. Introduction of Heuristic Method of teaching and corresponding assessment methods was not only requirement of the quality of academics but also an express requirement of the standards of the accreditation bodies.
2. Request was allowed by the Council and the use of Heuristic Method of teaching was formally introduced in the BBA and MBA programs of the BU. Curricula of these programs were redesigned accordingly. Heuristic Method of teaching, later, was also included into the performance goals of the faculty.
3. After return from their visit to Singapore universities in spring 2016, the BU Deans Presented the concept of Flipped Class Teaching Methodology, a highest level of student- centered/ heuristic method of teaching they had observed during their visit- a model whereby the students are supposed to do at home what they are otherwise supposed to do in the class and do in the class what they are otherwise supposed to do at home. The matter was discussed in the 26th Academic Council meeting which approved this method of teaching as a pilot program for the Fall 2016 to be run in the Management Sciences departments. Five courses at BUIC and BUKC each and two courses at BULC were planned to be run through this model during the Fall 2016. One or two rooms at each campus were also converted smart class room to meet the requirement of the model.

4. The progress report was constantly submitted to the Academic Council meetings which showed that the model could be run only partially, with the following salient elements:

- a. Curricula could not be flipped substantially.
- b. Faculty were not given focused training on this model.
- c. The required IT support necessary for running this kind of teaching model was not available.
- d. The larger class size of the BBA and MBA programs offered a hurdle to the teaching model

5. Accordingly, the 32nd ACM decided to restrict the Flipped Class Teaching model to the MS/MPhil and PhD programs owing to small class size of these programs. It was also decided that the faculty will be trained by the LDC properly and more classrooms at all Campuses will be converted into smart classrooms.

6. The matter was again taken up by the 34th ACM wherein it was observed that a lot of efforts are still required for implementation of the Flipped Class Teaching model despite hectic pursuance since 2016. A committee was constituted by the Council comprising Deans, headed by DG BUKC to overview the subject method of teaching and submit a complete roadmap for its implementation along with incorporation of assessment methodology, and use of IT support including Learning Management System and lecture recording system.

OBSERVATIONS AND RECOMMENDATIONS

1. The committee held multiple meetings. It grasped the view of the Flipped Class Teaching Method, its various elements and the procedural and infrastructure requirements involved. It also had a view of the history of efforts made at the BU for implementation of this model, as summarized above, and the limitations it faced.

2. From the history of Academic Council proceedings spanning 26th to 34th meeting. The committee concluded that although the model was initiated with a great aim it could not be implemented adequately. Teachers were not given focused training, the curricula were never sufficiently flipped, and the required IT support was not available. For running the courses through Flipped Class model, a strong IT portal is needed through which discussions could be held live among the teachers and the students and materials can be shared. But this system was not available. For a good level of flipping, lecture recording is also involved. But no lecture recording equipment was installed in the customized classrooms.

3. Keeping the above observation in view, the committee recommends the following:

- a. A mechanism of implementation of the Flipped Class Teaching model in the form of an annual roadmap be followed. The committee has proposed a roadmap in this regard that is placed at Annex 'A' to Appendix 35(2334).
- b. All key players given in the roadmap need to play their role thoroughly so that a culture of Flipped Class Teaching model could be developed in the postgraduate programs.
- c. Faculty members teaching the MS/MPhil and PhD programs through Flipped Class teaching model be trained mainly through international resources on the teaching methodology including the use of IT support involved. Being the core determinant of success of this model, this aspect needs special emphasis.

- d. Two classrooms at BUIC and BUKC each and one classroom at BULC have already been converted to smart classrooms required for implementation of Flipped Class Teaching model. These rooms are sufficient for the pilot project wherein four to five courses can be taught at the BUIC and BUKC each and two to three courses at the BULC, each semester.
- e. Presently, basic IT support in the form of computers is available in the smart Classrooms. However, further IT support to run the Flipped Class Teaching model is needed that includes smart boards, online discussion portals and lecture recording equipment etc. Deans can identify further IT Support as the project matures.
- f. In line with the Flipped Class Method of teaching. Assessment/examination of the students in the courses being run through this method mainly be of formative nature. Such assessment, which is in the form of on- and off –the –class activities, helps the faculty identify where students are struggling and address problems immediately. It also helps the students identify their own strengths and weaknesses and mark the areas that need more attention. However, exact proportion of consultation with the faculty member concerned and the HOD.
- g. At the end of spring semester each year, the project be evaluated by the Directorate of Academics through a mechanism developed by the Directorate with The consultation of Deans. Evaluation report thus generated be discussed in the Academic Council and quantum of the next two-semester project be decided by the Academic Council in the light of this evaluation report Number of courses in the next project be adjusted accordingly.
- h. Flipping the courses and delivering them accordingly is a time and energy consuming process. Thus, course load of the faculty members opting for the project be reduced. Reduction in course load be done in such a way that one course taught through Flipped Class Method is equivalent to two courses taught through regular method.
- j. The project will involve base and recurrent costs on the following counts, which should be budgeted:
 - i. Establishment maintenance of small classrooms in each campus proportionate to the number of courses included in the project.
 - ii. IT equipment/portal required
 - iii. Focused training of the faculty members' included in the project mainly from international resources.
 - iv. Adjusted teaching load of the faculty member included in the project.

YEARLY FLIPPED CLASS TEACHING METHOD IMPLEMENTATION ROADMAP

Flipped Class Method of teaching shall work at BU on two-semester (Fall-Spring) project basis each year. This project shall be undertaken in following stages:

Stage - 1: Identifying and Allocating the Courses

1. At the end of spring semester each year, Faculty Deans with consultation of the HODs running the MS/MPhil and PhD programs shall identify the courses to be run Through the Flipped Class Method of teaching during the forthcoming fall and spring semesters. Number of Courses to be included into the project shall depend upon the number of smart classrooms available at the campus, number of MS/MPhil and PhD Programs being run in each department at that campus, and the level of maturity of those programs.
2. Faculty Deans with the consultation of HODs shall also identify the faculty members who shall those courses. Preferably, the faculty members' joining the program shall be voluntary basis. The process of course identification and allocation shall be completed by the end of the month of June.

Stage – II: Identifying the Required IT Support

1. Directorate of IT shall be responsible for providing requisite IT support mainly the Hardware smart boards, discussion portals and lecture recording devices.
2. Faculty Deans, in consultation with the HODs and the faculty member concerned, shall ascertain any additional IT support required for running the particular courses through Flipped Class Method which shall be arranged by the Directorate of IT.
3. Installation of IT facilities required by the Deans and HODs shall be completed by the mid of the month of July.

Stage - III: Training the Faculty Members

1. The faculty members identified for the program shall be trained in Flipped Class Method and the use of IT support in it by national and international resources.
2. BU Leadership Development Centre shall decide the quantum of training for the Faculty members in consultation with the Deans.
3. The training process will be completed by the end of the month of July.

Stage IV: Flipping the Courses

1. Soon after completion of training, courses to be taught through this methodology shall be flipped by the respective faculty members and the relevant materials including Entire set of home and class activities shall be prepared accordingly.

2. Degree of flipping of each course shall be reviewed by the HODs and approved by the Deans.
3. Task of flipping the courses shall be completed by the mid of the month of August.

Stage-V: Deciding Assessment / Examination Mode

1. Although assessment/examination of the students in the courses being run through Flipped Class Method shall predominantly be of formative nature, exact predominantly be of formative and summative assessment for a course shall be decided by the Dean in Consultation with the faculty member concerned and the HOD before start of the semester.
2. The mode of assessment thus decided shall be included into the outline of the said Course.
3. If introduction of an assessment mode has statutory implications, approval of the competent forum shall be sought by the respective HOD.

Stage-VI: Monitoring Progress of the Courses

1. HODs through the help of Postgraduate Program Coordinators shall monitor progress of the courses being run through Flipped Class Method during the course of semester especially in the following areas:
 - a. Conduct of pre-class quizzes.
 - b. Course coverage recording during the 7th and 13th week of the semester including the conduct of home and class activities.
 - c. Conduct of quizzes during the semester.
 - d. Student's classroom/teacher related problems.
 - e. In-time submission of question papers and exam results.
2. PGP Coordinators shall prepare monthly monitoring report and submit to the HOD in the first week of the next month.
3. The HOD and PGP Coordinators shall give special attention to the newly inducted faculty and provide them necessary support.
4. The HOD shall conduct mid-term meeting with the faculty members running the courses through Flipped Class Method before the midterm examination. During the meeting, all areas mentioned above shall be reviewed.
5. Besides formal contacts and meetings, the HODs shall ensure that faculty members running the courses through Flipped Class Method are frequently contacted informally as well and given on-going informal feedback on their current performance
6. The faculty members shall be provided due support by the HODs in connection with running the courses during the semesters.
7. Deans shall receive progress report from the HODs for each course after the midterm and the final exams and shall take measures accordingly.

Stage VII: End-of Semester Review

1. At the end of fall semester, the Deans shall receive the semester progress report from the HODs and shall conduct its review in the light of the Flipped Class Requirements point out in this roadmap.
2. In the light of this review, the Deans shall point out the corrective actions needed to be incorporated in the Spring semester proceedings.

Stage VIII: Project Evaluation

1. At the end of spring semester each year, the project shall be properly evaluated by the Directorate of Academics through a mechanism developed by the Directorate with the Consultation of Deans.
2. Evaluation report thus generated shall be discussed in the Academic Council.
3. Quantum of the next two-semester project shall be decided by the Academic Council in the light of previous evaluation report. Number of courses in the project shall be Increased or decreased accordingly.

Appendage 35(3421)

CURRICULUM ROAD MAPS & COURSE CODES
BACHELOR OF SCIENCE IN PUBLIC HEALTH (BSPH)
AT BUMDC

Campus: BUMDC OR (depending on availability of infrastructure, the Karachi Campus)
 Department: Initiated by Department of Community Health Sciences
 Program Title: Bachelor of Science in Public Health
 Program Level: -
 Total Duration of Program: Four Years (as per (HEC))
 Total Number of semesters: 8 Semesters
 Total Credit Hours: 133 Credit Hours

Semester-1

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1	FSc/FA	ENG 103	English-I	3	3	0
2		PAK 101	Pakistan Studies	2	2	0
3		MAT 105	Mathematics	3	2	1
4		LSB 110	Life Sciences Biology	3	2	1
5		SHD 111	Sociology of Health and Disease	3	2	1
6		BCM 109	Basic Computer Skills	3	2	1
Total Credit Hours in Semester-1				17		

Semester-2

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1	Semester 1	ENG 104	English-II	3	3	0
2		ISL 101	Ethics/Islamic Studies	2	2	0
3		BST 108	Basic Statistics	3	2	1
4		PPS 112	Principles of Psychology	3	2	1
5		MAP 113	Medical Anthropology	3	2	1
6		PHY 118	Personal Hygiene	3	2	1
Total Credit Hours in Semester-2				17		

Semester-3

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		ENG 201	English-III	3	3	0
2		ICT 217	Introduction to Information, Communication Technology	3	2	1
3		POD 214	Population Dynamics	3	2	1
4		PHC 215	Primary Health Care	3	2	1
5		CHD 219	Concept of Health and Disease	3	2	1
Total Credit Hours in Semester-3				15		

Semester-4

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		ENG 204	English-IV (any other subject may be offered)	3	2	1
2		PET 216	Professional Ethics	3	2	1
3		BEP 220	Basic Epidemiology	3	2	1
4		BBI 221	Basic Biostatistics	3	2	1
5		PAS 222	Health Promotion, Advocacy & Social Mobilization	3	2	1
Total Credit Hours in Semester-4				15		

Semester-5

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		CNT 323	Community Nutrition	3	2	1
2		CPD 324	Community Pediatrics	3	2	1
3		FIN 328	Fundamental Principles of Infectious Disease	3	2	1
4		CDE 329	Communicable Diseases Epidemiology	3	2	1
5		NCE 330	Non-Communicable Disease Epidemiology	3	2	1
Total Credit Hours in Semester-5				15		

Semester-6

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		RPH 325	Reproductive Health	3	2	1
2		EOH 326	Environment& Occupational Health	3	2	1
3		HPM 331	Health Policy and Management	3	2	1
4		HLP 332	Health Planning	3	2	1
5		DHM 333	District Health Management	3	2	1
6.		HPE 334	Health Professional Education	3	2	1
Total Credit Hours in Semester-6				18		

Semester-7

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		MHL 427	Mental Health	3	2	1
2		HMT 442	Health Marketing (compulsory elective)	3	2	1
3		REM 435	Research Methodology	3	2	1
4		DSM 444	Disaster Management (Elective I)	3	2	1
5		HIS 444	Health Information System (Elective II)	3	2	1
6		RSP 441	Research Project planning	3	2	1
Total Credit Hours in Semester-7				18		

Semester-8

S No	Pre-requisite Course Code	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1		MIB 436	Microbiology	3	2	1
2		ETL 437	Entomology	3	2	1
3		PAR 438	Parasitology	3	2	1
4		HPM 445	Health Project Management (Elective III)	3	2	1
5		ASH 446	Adolescent and Sexual Health (Elective IV)	3	2	1
6		RSI 442	Research Project Implementation	3	2	1
Total Credit Hours in Semester-8				18		

LIST OF ELECTIVE COURSES*¹

S No	Course Code	Course Title	Credit Hours	Theory	Lab (if any)
1.	HMT 443	Health Marketing	3	2	1
2.	DSM 443	Disaster Management (Elective I)	3	2	1
3.	HIS 444	Health Information System (Elective II)	3	2	1
4.	HPM 445	Health Project Management (Elective III)	3	2	1
5.	ASH 446	Adolescent and Sexual Health (Elective IV)	3	2	1
6.	QMH 447	Quality Management in Health Care	3	2	1
7.	SIH 448	School Health	3	2	1
8.	INH 449	International Health	3	2	1
9.	HEC 450	Health Economics	3	2	1
10.	HEP 451	Health Financing	3	2	1
11.	APH 452	Art and Public Health	3	2	1
12.	COD 453	Community Dentistry	3	2	1
13.	COP 454	Community Psychiatry	3	2	1
14.	CON 455	Community Nursing	3	2	1
15.	FOS 456	Food Safety	3	2	1
16.	ASR 457	Addiction and Social Rehabilitation	3	2	1
17.	NUM 458	Nuclear Medicine	3	2	1
18.	SPM 459	Sports Medicine	3	2	1
19.	RIM 460	Risk Management	3	2	1
20.	GER 461	Geriatrics	3	2	1
21.	HIM 462	Health Inventory Management	3	2	1
22.	PRH 463	Prison Health	3	2	1

¹ * All the possible recommended Elective Courses have been listed, however each year 4 new courses will be introduced according to the availability of faculty and having adequate students to opt for an elective. Note that 4 electives must be selected by students. The compulsory Elective is considered as the major course or compulsory Elective.

NEW PROGRAMME PROPOSAL**A. ACADEMIC DETAILS**

1	Faculty/Department: Department of Public Health
2	Title of the Programme: (to be printed on Degree/Transcript) BSc. Public Health
3	Mission of the Programme: The mission of the Bachelor of Science in Public Health (BSPH) is to preserve, promote, and improve the health and well-being of populations, communities, and individuals.
4	<p>Objectives of the Programme:</p> <ol style="list-style-type: none"> 1. Produce competent, committed and skilled public health professionals. 2. Provide a foundation for choosing a relevant Track in Public Health in future. 3. Prepare a skilled workforce in public health auxiliary and support services 4. Prepare leadership in public health. 5. Develop, administer and evaluate health policies and programs. 6. Participate directly in efforts to improve the health of the community using community-based and health systems' assessment of preventive services. 7. Conduct basic and applied research relevant to the description, risk factors, and interventions for the resolution of health problems in the human populations.
5	<p>Outcomes of the Programme:</p> <p>At the end of the program, the graduate is expected to:</p> <ol style="list-style-type: none"> 1. Detect, prevent and manage common public health problems in Pakistan 2. Acquire basic computer skills 3. Supervise, monitor and manage public health issues 4. Be effective communicator 5. Practice and promote professional ethics 6. Conduct basic research and prepare reports 7. Analyze health system problems 8. Develop critical thinking and creativity 9. Create a cultural context in which public health professionals work 10. Involve community dynamics and networking 11. Prepare for health advocacy, teamwork and leadership, and professionalism
6	<p>Rationale for the Programme:</p> <p>Pakistan's Health Indicators alongwith the international commitments for achieving various targets including the SDGs (Sustainable Development Goals) targets are not showing the desired results. Pakistan is facing the burden of not only Communicable Diseases but also the Non-Communicable Diseases besides the rapidly growing population and environmental degradation and its consequences. The responses to these challenges are usually done by building more hospitals and more doctors without realizing the fact that many of these health-related problems are preventable and manageable at a very relatively lower cost by not very highly qualified doctors/specialists. The practice of Public Health has been internationally proven to be the most cost-effective intervention by any country for improving health status. However, the Public Health training, practice and its integration in health system of Pakistan has yet to evolve, nurture, grow and ultimately produce role models. Pakistan's spending on health is very low and having just network of hospitals and some community services along with unregulated and rapidly mushrooming private sector;</p>

	the patients are being “treated” who manage to seek or encounter a service center or a health provider. Thus, with increasing poverty, changing lifestyles and many other social, psychological, environments and demographic challenges, the ‘occurrence’ of diseases will keep on increasing. It is high time that we in BUMDC should initiate a comprehensive Programme which should be able to address all these challenges under one umbrella by producing the human resource which will then contribute in improving the health status of Pakistan.
7	<p>Brief Description of the Programme:</p> <p>The main purposes of the launching this innovative & pioneer program are to:</p> <ul style="list-style-type: none"> • Develop quality training and research opportunities in Public Health at various levels educational attainment. • Produce a key mass of Public Health specialists who can then be a productive professional in both Pakistan and globally. • Provide technical advisory services related to Public Health to government, non-government, agencies, international and donor groups and the private-for-profit sector. <p>The minimum criteria for getting admission in BSPH would be FSc/FA and equivalent with a minimum of 2nd division. However, Bahria University may consider raising the minimum division or cut-off marks. This will be a semester-based program having 2 semesters per year and will be spread over 4 years; it will be a morning program. There will be 44 major courses having 133 Credit Hours spread over 4 years. <i>Field Visits and Seminars by students will also be conducted as compulsory subjects but will be non-credited.</i> The selective subjects will also have regular tutorials following the interactive and problem-based learning, as needed. The details of the curriculum with credit hours are shared in Annex A and follows the recommendations made by HEC.</p>
8	Duration: 4 years
9	<p>Venue(s): On Site/Off Site/Both On & Off Site (Tick one; if Off Site, give details)</p> <p>Should be one site—but need to ensure the adequate infrastructure as well as faculty</p>
10	<p>Programme Scheduling Format:</p> <p>Morning/Evening/Weekend (tick one) Morning</p> <p>Semester/Annual/ (tick one) Semester</p>
11	Proposed Date of Commencement: Depends on availability of faculty and infrastructure
12	Mode of Study/Examination: BCQs, SEQs, OSPEs, including continuous evaluation and attendance
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>Please see enclosed as Annex 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>Please see enclosed as Annex I</p>
15	<p>Additional Classroom(s) required: (<i>The requirement is to include the number of classrooms and their capacities.</i>) Please see enclosed as Annex I</p>

16	Additional Requirement for Laboratories: (<i>The requirement is to include the number of laboratories, their equipment and their capacities.</i>) Please see enclosed as Annex I
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: Please see enclosed as Annex I
18	Minimum Qualification for Admission: FSCs/FAs or other equivalents
19	Admission Eligibility Criteria: (to be aligned with accreditation/regulatory bodies) At least good 2 nd division (as recommended by HEC)
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
21	Number of Admissions Expected for First Intake: 50
22	Number of Admissions Planned/Expected for Subsequent Intakes: 50 each year (may be increased depending on capacity of infrastructure as well as having adequacy of Faculty)
23	Referred by: (<i>delete which is inapplicable</i>) FBOS: (<i>Indicate the FBOS meeting reference and Item No</i>) BU-DHS – 27-(FBoSoHS)/ Held on 17 th September 2019
24	Complete Plan of Studies, inclusive of complete Roadmap: (<i>Attach as Annex 'A'</i>) (see enclosed)
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (<i>Attach as Annex 'C'</i>)

B. FINANCIAL DETAILS	
1	Source of Funding: <ul style="list-style-type: none"> • BU: Fully/Partially: FULLY • Public Sector (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) NIL • 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: 4 YEARS Annual or Semester System: ANNUAL Annual Number of Years FOUR Semester: Number of Semester EIGHT Total Number of Credit Hours: 133
3	Expected fee to be charged based on Cost & Benefits Analysis: (show working) Per annum fee: or Fee rate per credit hour:
4	Expected Number of students for 1st & 2nd Intakes: 50 EACH YEAR
5	Expected Earning from first two Intakes (B5): (Show working) 114,000,000
6	Expected Earnings for the Next Five Years (B6): (show working) 936,060,000
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working) faculty and staff 108,440,000
8	Cost of Additional Laboratory Equipment/Tools (B8): (show working) 9,000,000
9	Cost of Additional Classrooms (B9): (Include furniture, technical aids etc) Faculty rooms and class rooms 28,600,000
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details) 20,000,000
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (Show details)
12	Miscellaneous Expenses required for Starting the Program (B12): - Advertisement: 2,000,000 <ul style="list-style-type: none"> - 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: 16,804,000
14	Total Cost of the Programme (B14): [Add B(7) to B(12)] 168,040,000
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] - 168,040,000
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] -282,040,000
17	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>) 89,706,000
18	Projected Annual Net Earning in Subsequent Years: [<i>Subtract B(13) from B(17)</i>] -72,902,000

Note: See detailed description and cost working separately done as an Annex

Annex 1-to SOP- word file for description and explanation

Annex 2 to SOP- detailed working on Excel sheet

Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended)**BACHELOR OF SCIENCE IN PUBLIC HEALTH (BSPH)****Admission Criteria:**

- FSc/FA and equivalent with minimum 2nd division

SCHEME OF STUDIES

S. No	Categories	Credit Hours	No. of Courses
1.	Compulsory Requirement (No Choice)		
1.1	<i>English I</i>	3	
1.2	<i>English II</i>	3	
1.3	<i>English III</i>	3	
1.4	<i>English IV (any other subject may be offered)</i>	3	
1.5	<i>Pakistan studies</i>	2	
1.6	<i>Ethics/Islamic Studies</i>	2	
1.7	<i>Mathematics 1</i>	3	
1.8	<i>Basic Statistics</i>	3	
1.9	<i>Basic Computers</i>	3	
		Total=25	
2.	General Courses to be chosen from other departments		7
2.1	<i>Life Sciences Biology</i>	3	
2.2	<i>Sociology of Health and Disease</i>	3	
2.3	<i>Principles of Psychology Medical</i>	3	
2.4	<i>Medical Anthropology</i>	3	
2.5	<i>Anthropology Population Dynamics</i>	3	
2.6	<i>Primary Health Care</i>	3	
2.7	<i>Professional Ethics</i>	3	
2.8	<i>Introduction to Information Communication Technology (ICT)</i>	3	
		Total=24	

3.	Discipline-Specific Foundation Courses		10
3.1	<i>Personal Hygiene</i>	3	
3.2	<i>Concept of Health and Disease</i>	3	
3.3	<i>Basic Epidemiology</i>	3	
3.4	<i>Basic Biostatistics</i>	3	
3.5	<i>Health Promotion, Advocacy & Social Mobilization</i>	3	
3.6	<i>Community Nutrition</i>	3	
3.7	<i>Community Pediatrics</i>	3	
3.8	<i>Reproductive Health</i>	3	
3.9	<i>Environment& Occupational Health</i>	3	
3.10	<i>Mental Health</i>	3	
		Total=30	
4.	Major Courses including research project / Internship		14
4.1	<i>Fundamental of Infectious Disease</i>	3	
4.2	<i>Communicable Disease Epidemiology</i>	3	
4.3	<i>Non Communicable Disease Epidemiology</i>	3	
4.4	<i>Health Policy and Management</i>	3	
4.5	<i>Health Planning</i>	3	
4.6	<i>District Health Management</i>	3	
4.7	<i>Applied Epidemiology Research</i>	3	
4.8	<i>Methodology Microbiology</i>	3	
4.9	<i>Entomology</i>	3	
4.10	<i>Parasitology Field</i>	3	
4.11	<i>Visits</i>	3	
4.12	<i>Seminars by students Research</i>	0	
4.13	<i>Project Planning</i>	0	
4.14	<i>Research Project Implementation</i>	3	
4.1.5	<i>Health Professional Education</i>	3	
		42	

5.	Electives within the major		4
5.1	Health Marketing (Compulsory Elective)	3	
5.2	Disaster Management (Elective I)	3	
5.3	Health Information System (Elective II)	3	
5.4	Health Project Management (Elective III)	3	
5.5	Adolescent and Sexual Health (Elective IV)		
5.6	Quality Management in Health Care		
5.7	School Health		
5.8	International Health		
5.9	Health Economics		
5.10	Health Financing		
5.11	Art and Public Health		
5.12	Community Dentistry		
5.13	Community Psychiatry		
5.14	Community Nursing		
5.15	Food Safety		
5.16	Addiction and Social Rehabilitation		
5.17	Nuclear Medicine		
5.18	Sports Medicine		
5.19	Risk Management		
5.20	Geriatrics		
5.21	Health Inventory Management		
5.22	Prison Health		
		12	
		133	44

Semester Distribution

Semester	Categories	Credit Hours	No. of Courses
First	Compulsory Requirement (No Choice) <i>English I</i> <i>Pakistan Studies</i> <i>Mathematics</i> <i>Life Sciences Biology</i> <i>Sociology of Health and Disease (list)</i> <i>Basic Computer Skills</i>	3 2 3 3 3 3	6
		17	
Second	<i>English II</i> <i>Ethics/Islamic Studies</i> <i>Basic Statistics</i> <i>Principles of Psychology</i> <i>Medical Anthropology</i> <i>Personal Hygiene</i>	3 2 3 3 3 3	6
		17	

Third	<i>English III</i> <i>Introduction to Information, Communication Technology</i> <i>Population Dynamics</i> <i>Primary Health Care</i> <i>Concept of Health and Disease</i>	3 3 3 3 3	5
		15	
Fourth	<i>English IV (any other subject may be offered)</i> <i>Professional Ethics</i> <i>Basic Epidemiology</i> <i>Basic Biostatistics</i> <i>Health Promotion, Advocacy & Social Mobilization</i>	3 3 3 3 3	5
		15	
Fifth	<i>Community Nutrition</i> <i>Community Pediatrics</i> <i>Fundamental Principles of Infectious Disease</i> <i>Communicable Diseases Epidemiology</i> <i>Non Communicable Disease Epidemiology</i>	3 3 3 3 3	5
		15	
Sixth	<i>Reproductive Health</i> <i>Environment& Occupational Health</i> <i>Health Policy and Management</i> <i>Health Planning</i> <i>District Health Management</i> <i>Health Professional Education</i>	3 3 3 3 3 3	6
		18	
Seventh	<i>Mental Health</i> <i>Health Marketing (Compulsory elective)</i> <i>Research Methodology</i> <i>Disaster Management (Elective I)</i> <i>Health Information System (Elective II)</i> <i>Research Project Planning</i>	3 3 3 3 3 3	6
		18	
Eight	<i>Microbiology</i> <i>Entomology</i> <i>Parasitology</i> <i>Health Project Management (Elective III)</i> <i>Adolescent and Sexual Health (Elective IV)</i> <i>Research Project Implementation</i>	3 3 3 3 3 3	6
		18	

Note:

Field Visits and Seminars by students will be non-credit, but compulsory subjects spread over each Semester

DETAIL OF COURSES (Objectives and Contents of the courses)

1. Compulsory requirement (No Choice)

1.1	English I (Functional English)	Annexure A
1.2	English II (Communicational Skills)	Annexure B
1.3	English III (Technical Writing)	Annexure C
1.4	English IIII (Any other subject can be offered)	
1.5	Pak-Studies	Annexure D
1.6	Islamic Studies	Annexure E
1.7	Mathematics I (Algebra)	Annexure F
1.8	Basic Statistics	Annexure G
1.9	Introduction to Information and Communication Technologies	Annexure H

2. General Courses

2.1 Life Sciences Biology

Learning Outcomes:

After studying this course, you should be able to:

1. Demonstrate a broad basic knowledge of the biological sciences.
2. Demonstrate a thorough understanding and competency in a specific discipline within the biological sciences.
3. Communicate scientific ideas effectively in both oral and written formats.
4. Think critically and evaluate, design, conduct and quantitatively assess innovative research in a biological discipline.
5. Have acquired the skills and knowledge needed for employment or advanced graduate or professional study in discipline related areas.

Course Contents:

1. Studying Life
2. Small molecules and chemistry of life
3. Routine carbohydrates & lipids
4. Nucleic Acids & origin of life
5. Cells: The working unit of life
6. Cell membranes
7. Cell Communication & Multicellularity
8. Energy Enzymes & metabolism
9. Pathway that harvest chemical energy
10. Photosynthesis
11. Cell Cycle & Cell division
12. Inheritance, Genes & Chromosomes
13. DNA and its role in inheritance
14. Gene mutation & Molecular Genetics
15. From DNA to protein: Gene Expression
16. Regulation of gene expression

17. Genosomes
18. Recombinant DNA technology
19. Gene expression & Development
20. Gene evolution
21. Mechanism of evolution
22. Evolution of gene & genomes
23. History of life and earth

Recommended Reading:

1. Erwin Schrödinger – What is Life? – Cambridge University Press
2. Craig Heller, David Sadava, David Hillis, May Berenbaum - Life: The Science of Biology
3. David Sadava - Life: The Science of Biology

2.2 Sociology of Health & Diseases

Learning Outcomes:

After studying this course, you should be able to:

- Discuss the social contexts of wellness and illness
- Explain the patient's perspective on the experience of illness including meaning making and interaction with care providers
- Examine the social-historical transformation of the medical system in the U.S., including the changing role of physicians and other health care providers
- Interpret visual and written depictions of indicators and trends in population health over time
- Identify the socio-cultural aspects of health and illness, particularly as relating to the definitions of health, illness behavior and social epidemiology
- Investigate the social causes of disease and illness related to disparities due to social stratification and unequal access
- Describe the historical role of women in the medical system as patients, practitioners and health care providers
- Differentiate the current ethical issues and debates about new medical technologies and their impact on doctor-patient relationships and on access to health care

Course Contents:

1. Evolution of Health & Healing,
2. Body, Mind, Illness and Environment
3. Theories, research and debates of medical sociology.
4. Social, environmental and occupational factors in health and illness;
5. The meaning of health and illness from the patient's perspective;
6. The historical transformation of the health professions and the health work force;
7. The social and cultural factors surrounding the creation and labeling of diseases;
8. Disparities in health, access to healthcare, and the quality of healthcare received;
9. Organizational and ethical issues in medicine including rising costs and medical technology; and health care reform.

Recommended Reading:

1. Bird, Chloe E., Peter Conrad, and Allen E. Fremont. 2000. "Medical Sociology at the Millennium." Pp. 1-10 in *Handbook of Medical Sociology, Fifth Edition*, edited by C.E. Bird, P. Conrad, and A. Fremont. Upper Saddle River, NJ: Prentice-Hall.

2. Link, Bruce, and Jo Phelan. 2010. "Social Conditions as Fundamental Causes of Health Inequalities." Pp. 3-17 in *Handbook of Medical Sociology, Sixth Edition*, edited by C. E. Bird, P. Conrad, A. M. Fremont and S. Timmermans. Nashville: Vanderbilt University Press
3. Shim, Janet. 2005. "Constructing 'Race' Across the Science-Lay Divide: Racial Formation in the Epidemiology and Experience of Cardiovascular Disease." *Social Studies of Science* 35: 405-436.
4. Prof. Saadat Farooq: Medical Sociology. Azeem Academy Karachi

2.3 Principles of Psychology

Description:

Surveys the basic concepts of psychology. Covers the scientific study of behavior, behavioral research methods and analysis, and theoretical interpretations. Includes topics that cover physiological mechanisms, sensation/perception, motivation, learning, personality, psychopathology, therapy, and social psychology.

Learning Outcomes:

After studying this course, you should be able to:

- Identify the major fields of study and theoretical perspectives within psychology and articulate their similarities and differences
- Differentiate between the major observational, correlational, and experimental designs used by psychologists; critically evaluate real world information sources.
- Identify the major parts of the nervous system including the brain and explain how they reciprocally influence emotion, behavior, and mental processes.
- Explain how people change physically, mentally, emotionally, and socially over the course of the life span using the major concepts of development
- Define consciousness and describe altered states of consciousness including sleep
- Differentiate between sensation and perception; articulate the major sensory pathways and how/where perceptual modifications can/does occur.
- Understand and describe major theories of motivation and be able to apply them to their own behavior
- Explain how organisms learn through classical conditioning, operant conditioning, and observational learning.
- Identify processes involved in the encoding, storage, and retrieval of information and how these processes impact the student's memory.
- Explain how people think using concepts, solving problems, and making judgments;
- Identify the major theoretical perspectives of personality and articulate their similarities and differences
- Differentiate between abnormal and normal behavior; identify the symptoms of major psychological disorders and explain what roles biological, psychological, and socio-cultural factors play in causing these disorders.

Course Contents:

1. The Scope of Psychology
2. The Functions of the Brain
3. On Some General Conditions of Brain-Activity.
4. Habit
5. The Automaton-Theory
6. The Mind-Stuff Theory
7. The Methods and Snares of Psychology

8. The Relations Of Minds To Other Things.
9. The Stream of Thought.
10. The Consciousness of Self.
11. Attention.
12. Conception.
13. Discrimination and Comparison.
14. Association.
15. The Perception of Time.
16. Memory.
17. Sensation.
18. Imagination.
19. The Perception of 'Things'
20. The Perception of Space.
21. The Perception of Reality.
22. "Reasoning."
23. The Production of Movement.
24. Instinct
25. The Emotions.
26. Will.
27. Hypnotism.

Recommended Reading:

1. Taylor - Health Psychology – 5th Edition – McGraw-Hill
2. Andrew Balim, Tracy A. Revenson – Handbook of Health Psychology
3. Jess Fiest, Linda Brannon – Introduction to Behavior and Health

2.4 Medical Anthropology

Learning Outcomes:

After studying this course, you should be able to:

- Discuss the ways in which ideas regarding health, illness, and treatment are socially constructed
- Analyze biomedicine as a cultural system and the nature of its spread around the globe
- Recognize the value of anthropology in understanding medicine and healing
- Break down complex academic journal articles into thesis, main points, and supporting evidence
- Conduct and present independent research on current popular health topics
- Successfully apply the arguments presented in academic articles to non-anthropological writing

Course Contents:

1. Introduction of Medical Anthropology
2. Culture and social aspects of the body, health, sickness and illness in the cross cultural prospective
3. Effects of culture on health
4. Medicalization
5. Authoritative knowledge and belief
6. Global inequities
7. The phenomenology of disability, death and role of medical schools
8. Understanding interpretive approaches, critical theory and phenomenology

Recommended Reading:

1. Fadiman, Anne 1997 *The Spirit Catches You and You Fall Down: A Hmong Child, Her American Doctors, and the Collision of Two Cultures*. Farrar, Straus, and Giroux.
2. Lock, Margaret 2002 *Twice Dead: Organ Transplants and the Reinvention of Death*. Berkeley: University of California Press.
3. Montross, Christine 2007 *Body of Work: Meditations on Mortality from the Human Anatomy Lab*. Penguin Books.
4. Murphy, Robert 1990 *The Body Silent: The Different World of the Disabled*. New York: W.W. Norton.

2.5 Population Dynamics

Learning Outcomes:

After studying this course, you should be able to:

- Define the demographic transition and explain its historical relevance
- Describe the principle mechanisms that are associated with declining mortality, fertility and migration as well as the relationship between these three processes.
- Analyze basic empirical relationships between demographic and socioeconomic conditions.
- Outline both macro and micro level processes of development and their relationship to population change.
- Recognize and relate the role of both gender and technology in specific contexts to show their importance in demographic change

Course Content:

1. Understanding demography and population dynamics
2. Demographic cycle
3. International demographic/population trends
4. Population dynamic in Pakistan
5. Life expectancy
6. Introduction to family planning
7. Population dynamics verses national economy
8. Population transition

Recommended Reading:

1. Boserup, Ester. 1965. *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*. Routledge.
2. Bongaarts, John, W. Parker Mauldin, and James F. Phillips. 1990. "The Demographic Impact of Family Planning Programs." *Studies in Family Planning* 21(6):299–310.
3. Das Gupta, Monica. 1987. "Selective Discrimination Against Female Children in Rural Punjab, India," *Population and Development Review* 13(1).
4. Dyson, Tim. 2001. "A Partial Theory of World Development: The Neglected Role of the Demographic Transition in the Shaping of Modern Society." *International Journal of Population Geography* 7(2):67–90.
5. Eastwood, Robert, and Michael Lipton. 2011. "Demographic Transition in sub-Saharan Africa: How Big Will the Economic Dividend Be?" *Population Studies* 65(1).
6. K. Park – Preventive and social medicine

2.6 Primary Health Care (PHC)

Learning Outcomes:

After studying this course, you should be able to:

- Define PHC and describe its core concepts
- Summarize the key factors that resulted in the development of PHC
- Explain the key principles and essential components of Comprehensive PHC
- Differentiate between Selective and Comprehensive PHC
- Enlist major achievements of PHC
- Describe organization of PHC services in Pakistan

Course Contents:

1. Introduction and Philosophy of PHC & HFA
2. Principles of PHC
3. Essential components of PHC
4. Barriers in implementation of PHC
5. Organization of PHC Services in Pakistan-1
6. Introduction to MDG's and SDG's
7. Introduction to National Health Programmes

Recommended Reading:

1. Principles of PHC. WHO
2. Strengthening PHC's in developing countries
3. PHC and MDG's. UNDP
4. Philosophy of PHC
5. WHR 2008

2.7 Professional Ethics

Learning Outcomes:

After studying this course, you should be able to:

- Ability to engage in informed critical reflection on the nature of professionalism and ethical challenges inherent in professionalism
- Knowledge of prominent normative ethics frameworks – consequentialist, deontological, virtue, and contractualism
- Awareness of types of ethical challenges and dilemmas confronting members of a range of professions (business, media, police, law, medicine, research)
- Ability to bring to bear ethical analysis and reasoning in the light of normative ethics frameworks on a selection of ethical challenges and dilemmas across the chosen range of professions
- Ability to relate ethical concepts and materials to ethical problems in specific professions and professionalism
- Ability to research appropriate material in relation to set questions in writing essays meeting the highest standards of rigor and clarity

Course Contents:

1. Understanding of the ethical problems and principles.
2. Understanding of the professionalism and ethics of other professions: how they interact and what can be expected from them as correct ethical behavior.
3. Benefit from a critical scrutiny of their own ethics by those from other professions.

4. The general principles of professional ethics.
5. Ethics of several major professions: Business Ethics, Media Ethics, Police Ethics, Medical Ethics, Legal Ethics, and Research Ethics.
6. The nature of a profession, professional codes of ethics, confidentiality, whistle-blowing.
7. The responsibility of business to the environment, uses and abuses of human research.
8. Animal ethics in research.

Recommended Reading:

1. Ethics for the Professions. John Rowan & Samuel Zinaich, Jnr. Wadsworth. 2003
2. Joan C. Callahan, Ethical issues in professional life, Oxford University Press, 1988.
3. Alan H. Goldman, The moral foundations of professional ethics, Rowman and Littlefield, 1980
4. Ruth F. Chadwick, (ed.) Ethics and the professions, Avebury, 1994.
5. Justin Oakley, Dean Cocking, Virtue ethics and professional roles. Cambridge University Press, 2001

3. Discipline Specific Foundation Courses

3.1 Personal Hygiene

Learning Outcomes:

After studying this course, you should be able to:

- Understand the importance of Personal Hygiene
- Identify the effects of eugenics on community
- Identify relationship of personal hygiene with disease
- Describe how personal hygiene improves health of individuals

Course Contents:

1. Introduction to Personal Hygiene
 - Handwash
 - Eye hygiene
 - Hair hygiene
 - Body hygiene
 - Oral hygiene
 - Nails and cuticles
 - Feet and shoes
 - Protection from noise and UV Light
 - Control of foul odour
2. Role of personal hygiene in communicable and Non communicable diseases
3. Types of cleanliness (intrinsic & extrinsic)
4. Prevention of cough cold and other contagious disease
5. Smoking and protecting rights of others
6. Personal hygiene at home
 - Clothes
 - Kitchen
 - Washroom
7. Personal hygiene at schools
8. Personal hygiene at surroundings
9. Personal hygiene at work place
10. Cleanliness and religion

Recommended Reading:

1. Healthy Living. Web Health Center
2. Sharon O Neil. Personal Hygiene Basic. Live Strong.com
3. Beth W Ornstein. A Guide to good personal hygiene. Everyday health.com
4. Virginia Smith. Clean: A History of Personal Hygiene and Purity. Oxford University Press

3.2 Concept of Health and Disease/Fundamentals of PH

Learning Outcomes:

After studying this course, you should be able to:

- Define and understand concept of health
- Identify determinants of health
- Enumerate the indicators of health
- Understand the concept of disease causation
- Understand iceberg of disease phenomenon
- Understand the levels of prevention
- Cover basic definitions and historical background of public health

Course Contents:

1. Concept of health
2. Dimensions of health
3. Definition of health
4. Health spectrum
5. Determinants of health
6. Responsibility of health
7. Indicators of health
8. Concept of disease
9. Concept of causation
10. Levels of prevention
11. Historical background of public health
12. Evolution of public health
13. Definitions of common public health terms
14. Health for all

Recommended Reading:

1. Basch PF. Textbook of international health, 2ndEd. New York, NY:OxfordUniversity Press.
2. Brownson RC, Baker BA, Leet TL, Gillespie KN. Evidence-based public health. New York, NY: OxfordUniversity Press; 2003.
3. Detels R, McEwen J, Beaglehole R, Tanaka H, (eds.). Oxford textbook of public health: the practice of public health, 4thed. Oxford: Oxford University Press; 2002.

3.3 Basic Epidemiology

Learning Outcome:

After studying this course, you should be able to:

- Understand the concept of Epidemiology, Epidemiological Studies and its application and uses in controlling Public Health problems
- Explain and practise some key techniques in epidemiology
- Understand some routine methods of data analysis
- Apply these techniques in a practical sense

Course Contents:

1. Introduction to Epidemiology
2. Measures of Disease Frequency: Prevalence and Incidence
3. Measures of Mortality
4. Descriptive Study Designs
5. Analytical Study Designs
6. Measures of Association
7. Criteria for Causation

Recommended Reading:

1. R. Beaglehole, R. Bonita, T.Kjellstrom Basic epidemiology AITBS India
2. Leon Gordis Epidemiology W.B. Saunders co.
3. Mausner JK , BAHN AK Epidemiology: An Introductory Text 3rd W.B. Saunders co.

3.4 Basic Biostatistics

Learning Outcomes:

After studying this course, you should be able to:

- Present & Interpret data in tabular and graphical forms
- Apply the basic rules of probability
- Summarize data using the appropriate measures of central tendency and variation
- Apply the principles of normal distribution on a population and on sample means
- Determine the required sample size for a given level of significance
- Determine & Interpret the confidence interval for sample means and proportions
- Apply the appropriate test of significance to test the hypothesis on a given data set

Course Contents:

1. Introduction to Biostatistics and its Application in Research
2. Data: its Types, Sources and uses
3. Organizing and Displaying Data
4. Measures of Central Tendency and Measures of Dispersion
5. Introduction to Statistical Software
6. Probability
7. Normal Distribution
8. Sampling Techniques
9. Confidence Intervals for Mean
10. Confidence Intervals for Proportion
11. Hypothesis Testing
12. Introduction to Tests of Significance
13. Correlation and Regression

Recommended Reading:

1. Pagano, Gauvreau Principles of Biostatistics 2nd Thomson
2. Rosner Fundamentals of Biostatistics 6th Thomson
3. Daniel WW Biostatistics: A Foundation for analysis in Health Sciences 5th (1990) Joh Wiley and Sons

3.5 Health Promotion, Advocacy and Social Mobilization

Learning Outcomes:

After studying this course, you should be able to:

- Describe the concept of health and its determinants
- Define Health Promotion and Develop an understanding about evolution of health promotion
- Explain the models of Health promotion
- Recognize the cultural diversities in Health Promotion
- Learn various strategies and methods for Health Promotion

Course Contents:

1. Concept and Determinants of Health

2. Health Literacy and Health Communication
3. Introduction of Health Education
4. Introduction to Health Promotion
5. Ottawa Charter, Jakarta Declaration, Healthy Cities 2000
6. Advocacy, Community Participation, Enablers and Healthy Public Policy
7. Approaches to Health Promotion
8. Cultural Diversity in Health Promotion
9. Intervention Programs
10. Social Mobilization

Recommended Reading:

1. Garry Egger, Ross Spark, Rob Donovan Health Promotion Strategies and Methods 2nd McGraw-Hill
2. Pakistan Medical Corps Health Education Handout Pakistan Medical Corps
3. Raingrubler B Health Promotion Theories Jones and Barlett Learning
4. Naidoo Foundations for Health Promotion Elsveir Health Sciences
5. National Institute of Health England: HPR 850 Theory at a glance: A guide for Health Promotion Practice National Institute of Health England: HPR 850

3.6 Community Nutrition

Learning Outcomes:

After studying this course, you should be able to:

- Identifying target populations that may be at nutritional risk
- Identifying and assisting in development of accurate nutrition education materials
- Demonstrate accurate understanding of the science of normal nutrition
- Communicate effectively, both orally and in writing
- Conduct needs assessments and develop nutrition interventions for individuals, groups and communities
- Use effective teaching strategies for individuals, groups, or through community education programming
- Apply understanding of the influence of socioeconomic, cultural, social, psychological, and ethnic food consumption issues and trends to nutrition practice
- Demonstrate professional attributes including time management, priority setting, work ethic, critical thinking, advocacy, and service to professional and community organizations
- Demonstrate active participation, teamwork and contributions in group settings

Course Contents:

1. Introduction to Human Nutrition and Balanced Diet
2. Identification of Population at Risk
3. Factors Contributing to Community Nutritional Disorders
4. Healthy Nutrition for Pregnant Women, Lactating Mothers and Children
5. Problems Related to Procurement, Storage, Supply and Distribution of Food to the Vulnerable Groups
6. Adequate Supply of Food (quality and quantity)
7. International Food Organizations (WFO etc)
8. Politics in Food Supply
9. Food Supply to Drought , Earthquake, War and Refugees

10. Management of Nutritional Disorder Diseases in Communities

Recommended Reading:

Author Books Hard/Online

1. Dr. Saira Afzal (HOD community med dept. KEMU) Concepts of community medicine Hard+Cheap+Easy
2. Dr. Saira Afzal (HOD community med dept. KEMU) Research Methodology and basic biostatistics Hard+Cheap+Easy
3. Naveed Alam Community Medicine Hard+Cheap+Easy
4. Park Preventive and social medicine Hard+Easy+Cheap
5. Muhammad Ilyas Public health and community medicine Hard+Easy+Cheap
6. US AID Nutrition Soft+Easy
7. Nouman Hashmi Community Medicine Hard+Easy+Cheap
8. Arlene Spark Nutrition in public health Soft+Downloadable (Google Books)
9. A Burgess, M Bijlsma, Community Nutrition Soft+Downloadable (Google Books)

3.7 Community Pediatrics

Learning Outcomes:

After studying this course, you should be able to:

- Establish public health perspective on child health
- Develop essential skills for neonatal care
- Monitor child growth and development
- Perform appropriate clinical and anthropometric assessments for the nutritional status of infants and children
- Assess, classify and describe appropriate treatment for sick children below the age of five years according to the principles of the Integrated Management of Childhood Illness
- Determine the nutritional requirements and the most common nutritional disorders affecting infants and children
- Familiarize with current child health programs

Course Contents:

1. Neonatal Care
2. Growth Monitoring
3. Promotion of Breastfeeding
4. Oral Rehydration
5. Immunization
6. Community Feeding
7. Nutritional Surveillance
8. Regular Health Check-ups

Recommended Reading:

1. Maternal and Child Health-Management Sciences for health. (www.msh.org)
2. Child Health: ebook. ecog-obesity.eu
3. Child growth standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by the World Health Organization and the United Nations Children's Fund
4. K. Park – Prevention and social Medicine

3.8 Reproductive Health

Learning Outcomes:

After studying this course, you should be able to:

- Define Reproductive Health and Reproductive Lifecycle
- Identify the underlying determinants of reproductive health
- Describe the causes and prevention of underlying issues

Course Contents:

1. Introduction to Reproductive Health and Life Cycle Approach
2. ICPD
3. Reproductive Behavior
4. Safe Motherhood
5. Breastfeeding
6. Contraception
7. STI's
8. Reproductive Health Rights
9. Gender Power and Reproductive Health
10. Infertility

Recommended Reading:

1. Catriona Melville Sexual and reproductive health at a glance John Wiley & Sons limited
2. Paul .F.A VAN LOOK Sexual and reproductive health; A public health perspective. Academic Press (AP) in imprint of Elsevier
3. Kulczycki, Andrzej Critical issues in reproductive health DOI. 10.1007/978-94-007-6722-5_1
springer series+ Business media Dodrechtwww.nap.edu
4. Barbara Anderson Reproductive health women & men's shared responsibilities. Jones & Barlette
5. Jonathean B. Kotch Maternal and child health. Jones & Barlette

3.9 Environment and Occupational Health

Learning Outcome:

After studying this course, you should be able to:

- Describe effects of environment on health
- Enforcement Policy
- Demands of the Health and Safety Service
- Training, Administration and Management Control
- Environmental Protection Inspection Service
- Licensing and Regulatory rule

Course Contents:

1. Air Pollution, its Hazards and Prevention
2. Noise Pollution, its Hazards and Prevention
3. Water Pollution, its Hazards and Prevention
4. Water Purification
5. Radiation, its Hazards and Prevention
6. Waste Management
7. Ozone Layer Depletion
8. Climate Change and Global Warming
9. Introduction to Occupational Health

10. Evolution of Occupational Health (Labor Movements)
11. Occupational Health Hazards and its Prevention
12. Work Place Safety
13. Prevention of hospital based health hazards in hospital workers
14. Social Security
15. Prevention of Gender Harassment

Recommended Reading:

1. Moore GS. Living with the earth: Concepts in environmental health science, 2nd Edition. Boca Raton, FL: Lewis Publishers;2002.
2. Sellers CC. Hazards of the job: from industrial disease to environmental health science. Chappel hill: University of North Carolina Press;1997
3. Vesilind PA, Pierce JJ. Environmental Pollution and Control, 4th Education Boston MA: Butter worths Publishers, 1983.

3.10 Mental Health

Learning Outcomes:

After studying this course, you should be able to:

- Define Mental Health and cover the basic concepts of Community Mental Health
- Enumerate common mental health problems in Pakistan
- Learn to apply levels of prevention to mental health problems
- Understand the biological, psychosocial and socioeconomic factors affecting mental health
- Describe the main reasons of substance abuse

Course Contents:

1. Introduction to Mental Health
2. Prevention of Mental ill Health and Promote Mental Health
3. Risk and Protective Factors for Mental Disorders
4. Socioeconomic Determinants of Mental Health
5. Mental Health and Quality of Life
6. Strengthening Community Network
7. Reducing Harm from Addictive Substances
8. Prevention of Child Abuse and Neglect
9. Coping with Parental Mental illness
10. Management of Mental Health in Rehabilitation Centers

Recommended Reading:

1. Compton MT. Social Determinants of Mental Health. 2015 American Psychiatric Association
2. Larol S. Handbook of Sociology of Mental Health. 2nded. Springer 2012
3. R Streevani A guide to Mental Health & Psychiatric Nursing 2nd Jaypee
4. The ICD-10 Classification of Mental and Behavior Disorders, AITBS/WHO.

**4. Major Courses Including Research
Project/Internship**

4.1 Fundamental of Infectious Diseases

Learning Outcomes:

After studying this course, you should be able to:

- Understand natural history of disease,
- List the common infectious diseases of public health importance

- Describe the global and national impact of common communicable diseases
- Discuss the strategies of control of common communicable diseases in Pakistan

Course Content:

1. Infection, Contamination, Pollution, Infestation, Infectious Disease, Communicable Disease, Contagious Disease
2. Host, Immune and Susceptible Person
3. Sporadic, Endemic, Epidemic, Pandemic, Epizootic, Exotic and Zoonotic
4. Contact, Fomites, Carriers, Vectors and Reservoir of Infection
5. Incubation, Infective, Prodromal Period and Generation Time
6. Cross Infection, Nosocomial, Opportunistic Infection and Iatrogenic Disorders
7. Surveillance, Eradication and Elimination
8. Reservoir and Source of Infections
9. Escape of Organism, Mode of Transmission, Entry Into the Body, Susceptible Host and Host Defenses (Immunity)
10. Controlling the Reservoir, Early Diagnosis and Treatment, Isolation, Quarantine, Disinfection Interruption of Transmission

Recommended Readings:

1. Mendel, Douglas, Bennets. Principles and Practices of Infectious Diseases.
2. Nelson KE. Epidemiology of Infectious diseases. General Principles. Jones and Barlet Publishers England

4.2 Communicable Disease Epidemiology

Learning Outcomes:

After studying this course, you should be able to:

- Understand Natural History of disease
- List common infectious disease of public health importance
- Describe the global and national impact of common communicable diseases
- Discuss the strategies of control of common Communicable Diseases in Pakistan

Course Content:

1. Disease Spread Through Respiratory Tract
2. GIT Infections
3. Vector-Borne Diseases
4. Zoonotic Diseases
5. Contagious Diseases
6. Surface Infections
7. Sexually Transmitted Infections
8. Emerging and Re-emerging Diseases

Recommended Reading:

1. Chanawongse K. Understanding primary health care management: from theory to practical reality. Bangkok: Buraphasip Press; 1990.
2. Dicker RC, et. al. Principles of epidemiology: an introduction to applied epidemiology and biostatistics, 2nded. Atlanta, GA, USA: Centers for Disease Control and Prevention, 1992. Self-study course 3030-G. Available from: URL:http://www.phppo.cdc.gov/PHTN//catalog/pdf-file/Epi_Course.pdf

4.3 Non Communicable Disease Epidemiology

Learning Outcomes:

After studying this course, you should be able to:

- Understand the importance of NCDs in Pakistan
- The awareness of the preventive strategies for NCDs
- Develop the health promotion strategies for NCDs
- Define and prevent injury, accidents and their types

Course Content:

1. Hypertension
2. Coronary Heart Diseases
3. Stroke
4. Cancers
5. Blindness
6. Diabetes Mellitus
7. Obesity
8. Injuries and Accidents

Recommended Reading:

1. Ministry of Health, Government of Pakistan, World Health Organization, Heartfile. National action plan for prevention and control of non-communicable diseases and health promotion in Pakistan: a public-private partnership in health. Islamabad, Pakistan: tripartite collaboration of the Ministry of Health, Government of Pakistan; WHO, Pakistan office, and Heartfile; 2004. Available from: URL: <http://www.heartfile.org/pdf/NAPmain.pdf>
2. Ilene Moroflubkin, with Pamela D. Larsen Chronic Illness 4th Jones & Bortlett Publishers

4.4 Health Policy and Management

Learning Outcomes:

After studying this course, you should be able to:

- Demonstrate understanding of human, social and economic dynamics of organizational behavior
- Develop competency in making effective managerial decisions under conditions of uncertainty
- Demonstrate capacity to apply conceptual framework for understanding political and policy process in healthcare
- Understand basic organization, financing and delivery of health service and public health systems

Course Content:

1. Introduction to Health Management
2. Strategic Management
3. Planning
4. Organization
5. Monitoring
6. Evaluation
7. Pakistan Health Policy 2009
8. Health Financing
9. Stewardship

10. History of Health Policy in Pakistan
11. Determinants of health policy

Recommended Reading:

1. Chanawongse K. Understanding primary health care management: from theory to practical reality. Bangkok: Buraphasilp Press; 1990.
2. Gourlay R. Training manual on health manpower management (8 volumes). Geneva: Division of Health Manpower Development, World Health Organization; 1988. Document no. WHO/EDUC/88.195.
3. McMahon R, Barton E, Ross F. On being in charge: a guide to management in primary health care, 2nded. Geneva: World Health Organization; 1992.
4. Reinke WA. Health planning for effective management (HPEM). New York, NY: Oxford University Press; 1988.
5. Shortell SM, Kaluzny AD. Health care management, 3rded. Albany, NY: Thompson Delmar Learning; 2000.
6. World Health Organization. The world health report 2000: Health systems – improving performance. Geneva: World Health Organization; 2000. Available from: URL: http://www.who.int/entity/whr/2000/en/whr00_en.pdf

4.5 Health Planning

Learning Outcomes:

After studying this course, you should be able to:

- Familiarize the students with the basic concept of planning, planning models, techniques and tools
- Understand the functions of planning machinery of Pakistan
- To understand the important terminology related to health planning for its implementation wherever required

Course Content:

1. Importance and Significance of Planning
2. Understanding the Planning Concepts
3. Planning Models
4. Types of Plans
5. Planning Process
6. Planning Tools
7. Planning Commission of Pakistan
8. Role of ECNEC in Planning
9. Planning for Planning

Reference Reading:

1. Green A. An introduction to health planning in developing countries, 2nd edition. Oxford: Oxford University Press; 1999.
2. Kielmann, AA, Janovsky K, Annett H. Assessing district health needs, services and systems: protocols for rapid data collection and analysis. London, UK: Macmillan Education Ltd and AMREF, 1995.
3. Green A. An Introduction to Health Planning in developing countries. ELBS London

4.6 District Health Management

Learning Outcomes:

After studying this course, you should be able to:

- Describe the district health care delivery system
- Inform the people about various health care services offered at different tiers of health care delivery system chain.

Course Content:

1. Introduction to Healthcare Care Delivery System in Pakistan {Public and Private Sector}
2. Organization of Health Care System in a District
3. Healthcare Services Delivered at Different Tiers of District Health Management Services.{Minimum Service Delivery Standards}
4. Health Information System at District Level.
5. Organization and Functioning of Dispensary, MCHC, BHU, RHC, THQ, DHQ,
6. Referral Chain of Patient from BHU to DHQ and onwards
7. Duties of Different Health Care Providers Employed in District Health Management.
8. Role of District administration in district health management
9. Nazim and its part in district health management

Recommended Reading:

1. Kielmann AA, Siddiqi S, Mwadime RK. District health planning manual: toolkit for district health managers. Islamabad, Pakistan: Multi-donor Support Unit, Ministry of Health; 2002.
2. Manual of Epidemiology for District Health Management. J. P. Vaughan, R. H. Morrow World Health Organization, 01-Jan-1989Medical198 page
3. Nabeela Ali. District Health Management Team. *PAIMAN. Contech International Health Consultants*

4.7 Applied of Epidemiology

Learning Outcomes:

After studying this course, you should be able to:

- Apply measures of disease frequency in Public Health using descriptive and cross-sectional surveys
- Describe further statistical procedures in Cohort and case-control studies
- Interpret the results of a study investigating the effects of Confounding, Bias and Chance.
- Describe the methods adopted to control for Confounding, Bias, and Chance in a study.
- Describe and interpret the results of an experimental study design investigating the possible sources of bias and its control in study designs and statistical analysis.
- Apply screening in disease control.
- Use the tests of significance for parametric data: three or more independent groups of observations (ANOVA)
- Use the tests of significance for categorical data:
- Use non-parametric tests for a single or more than one samples e.g. Wilcoxon's Rank sum tests, Mann-Whitney U-tests etc.
- Investigate the relationship and association of two or more continuous variables using regression, correlation and interpretation and presentation of correlation.
- Evaluation of interventions using appropriate epidemiological and statistical methods.

Course Contents:

1. Disease Frequency: Incidence and Prevalence
2. Proportional Morbidity and Mortality
3. Details of Measures of Association and Inference in Cohort and Case Control Studies
4. Application and Interpretation Issues in Screening Applied to Disease Control
5. Experimental Study Designs: Application and Interpretation of the Results
6. Application and Interpretation of Parametric Test: ANOVA in Experimental and other Study Designs.
7. Application and Interpretation of Non Parametric Tests: Chi Square Test for Several Proportions, $n \times k$ Tables and Tables with Ordered Data, Fisher's Exact Test, Non-parametric Tests for a Single or More than one samples e.g. Wilcoxon's Rank Sum Tests, Mann-Whitney U-tests.
8. Application and Interpretation of Regression, Correlation Coefficients, Coefficient of Determination in study Results.

Recommended Reading:

1. R. Beaglehole, R. Bonita, T. Kjellstrom Basic Epidemiology AITBS India
2. Leon Gordis Epidemiology W.B. Saunders co.
3. Mausner JK, Bahn AK Epidemiology: An Introductory Text 3rd W.B. Saunders Co.
4. Pagano, Gauvreau Principles of Biostatistics 2nd Thomson
5. Rosner Fundamentals of Biostatistics 6th Thomson
6. Daniel WW Biostatistics: A Foundation for analysis in Health Sciences 5th (1990) John Wiley and Sons.

4.8 Research Methodology

Learning Outcomes:

After studying this course, you should be able to:

- Importance of Qualitative and Quantitative Research
- Develop research protocol
- Critical appraisal of research paper
- Writing research paper

Course Content:

1. Introduction to Research Methodology
2. Types of Research
3. Selection of Research Topic
4. Formulation of Objectives
5. Literature Search
6. Writing Introduction
7. Plagiarism
8. Writing Methodology
9. Data Collection/Questionnaire Design
10. Analysis and Interpretation
11. Report Writing
12. Timeline (Gantt Chart)
13. Budget Plan
14. Research Ethics

Recommended Reading:

1. Varkivisser CM. WHO. Designing and Conducting Health System Research Projects. International Development Research Center

2. Abramson JH, Abramson ZH. Survey Methods in Community Medicine. 5th Edition. Churchill Livinstone
3. Taylor, Sinha, Ghoshal Research Methodology PHI
4. Martin Brett Davies Doing a successful Research Project Palgrave
5. S.R. Singh Research Methodology APH

4.9 Microbiology

Learning Outcomes:

After studying this course, you should be able to:

- Familiarize students with fundamental concept of Microbiology

Course Content:

1. Fundamentals of Microbiology
2. Introduction to Medical Microbiology
3. Gen. Immunology
4. Microbial Taxonomy
5. Gen. Virology
6. Mycology

Recommended Reading:

1. Black, J. G. 2005. Microbiology: Principles & Explorations, 6th edition, John Willey and Sons, N.Y. 2.
2. Talaro, K. P. 2008. Foundations in Microbiology: Basic Principles, McGraw-Hill Companies, N.Y. 3.
3. Tortora, G. J., Funke , B. R. and Case, C. L. 2008. Microbiology: an introduction 9th edition, Pearson Education.
4. Tortora, G. J., Funke, B. R. and Case, C. L. 2012. Study Guide for Microbiology: An Introduction. 11th edition. Benjamin-Cummings Publishing Company, U.S.A.

4.10 Entomology

Learning Outcomes:

After studying this course, you should be able to:

- Appreciate the value and importance of insects
- Understand the need for good management practices
- Learn about the classification, biology, ecology, behavior, and control of insects
- Identify major orders and families of insects
- Acquire skills for collecting, mounting, and preserving insects for scientific study

Course Contents:

1. Classification of Arthropod Vectors, General Characteristics of Arthropods, Mites & Ticks
2. Insects
3. Lice Bugs & Fleas
4. Flies
5. Mosquitoes
6. Common Arthropod Borne Diseases
7. Arthropods of Medical Importance (Mosquito, Flies, Fleas, Ticks, Mites and Human Lice)
8. Principles of Arthropods Control (Environmental, Chemical, Biological and Genetics)
9. Insecticides and Their Public Health Importance

Recommended Reading:

1. Awastheir, V.B. 2009. Introduction to General and Applied Entomology. Scientific Publisher, Jodhpur, India.
2. Dhaliwal, G.S. 2007. An Outline of Entomology. Kalyani Publishers, Ludhiana.
3. Elzinga, R.J. 2003. Fundamentals of Entomology. Prentice Hall.
4. Gullan, P. J. and P. S. Cranston. 2010. The Insects: An Outline of Entomology. 4thed., Wiley-Blackwell. A John Willey & Sons, Ltd., Publication, UK.
5. Lohar, M.K. 2001. Introductory Entomology. Department of Entomology, Sindh Agriculture University, Tandojam Sindh, Pakistan.

4.11 Parasitology

Learning Outcomes:

After studying this course, you should be able to:

- Describe in details the life cycle of medically important parasites.
- Define the organs commonly involved in the infection.
- Recall the relationship of this infection to symptoms, relapse and the accompanying pathology.
- Arrange the factors that determine endemicity of the parasite infection
- State the distribution and epidemiology of the parasites
- Explain the methods of parasite control, e.g. chemotherapy, molluscicides, general sanitation plus describing the advantages and disadvantages of each method.
- Demonstrate a broad understanding of the central facts and the experimental basis of modern Parasitology.
- Solve problems in the context of this understanding.
- Demonstrate practical skills in fundamental parasitological techniques.
- Present and interpret results obtained from using these techniques.
- Present information clearly in both written and oral form.

Course Content:

1. Identification of parasites
2. Life cycles.
3. Epidemiological factors.
4. Host-parasite relationships.
5. Immunity to parasites.

A. Protozoa

- Plasmodium and Malaria
- Entameoba Histolytica and Dysentery
- Giardia Lamblia and Giardiasis
- Trichomonas and Trichomoniasis
- Leishmania and Leishmaniasis

B. Helminths

- Taeniasaginata, Ancylostomaduodenale, Ascaris, enterobiusvermicularis and worm infestation

C. Ectoparasites

- Pediculushumanus and Head lice
- Sarcoptesscabei and scabies

6. Recent molecular techniques.
7. The appropriate preventive and control measures.

Recommended Reading:

1. Roberts LS, Janovy Jr J. 2009. Foundations of Parasitology, 8thed., McGraw-Hill, New York. 701 pp. ISBN 978-0-07-302827-9.
2. General parasitology-Thomas C Cheng
3. Medical parasitology-Markell and Voges
4. Foundation of parasitology-Roberts, Janovy
5. Human parasitology-Burton J Bogtish.

4.12 Health Professions Education

Learning Outcomes:

After studying this course, you should be able to:

1. Understand and apply educational research in health professions education.
2. Design evidence-based educational programs and materials with appropriate scope, sequence, and focus for learners.
3. Deliver effective, theory-based instruction in large group and small group.
4. Effectively use assessment tools to reflect student progress and to promote student learning.
5. Evaluate the effectiveness of programs, curricula and instructional events.
6. Provide reflective and evidence-based leadership.

Course Contents:

1. Theories of learning and skill development
2. Student-centered learning, active learning, deep learning, collaborative learning
3. Conditions of learning: characteristics of powerful learning environments
4. Using reflective practice to promote learning
5. Educational principles and theories related to clinical teaching and learning
6. Identify different approaches to curriculum development and their underlying philosophies
7. Identify local, national and international drivers which shape curricula in medical education
8. Design and critique programmes (courses) and modules (components of courses) in medical education
9. Design and critique evaluation strategies and models for programs and modules
10. Develop assessment strategies
11. Design assessment tasks appropriate to a range of learning outcomes
12. Research approaches, methods and techniques in health professions education

Recommended Books:

1. A Practical Guide for Medical Teachers. Dent JA & Harden, RM (3rd Ed). Churchill Living Stone, Elsevier, 2009
2. ABC of Learning and Teaching in Medicine 2nd Ed. Cantillon & Wood, 2010
3. Assessment in Medical Education: Trends and Tools. Sood R, Paul VK, Mittal S, Adkoli BV, Sahni, P, Kharbanda OP, Verma, K., Nayar U.(eds). New Delhi: KL Wig CMET, AIIMS, 1995.
4. Basic Methods of Medical Research. Indrayan A (1st Ed), 2006.
5. Communication Skills in Clinical Practice. Sethuraman KR (1st Ed) Jaypee Brothers, 2001.
6. Educational Handbook for Health Personnel. Guilbert JJ (6th Ed). WHO, 1987

4.13 Field Visits

4.14 Seminars by students

4.15 Research Project

5. ELECTIVES WITHIN THE MAJOR

5.1 Prisons Health

Learning Outcomes:

After studying this course, you should be able to:

- Understand the health and social problems of Prisoners
- Provide Counseling services for prevention and rehabilitation of prisoners leading to skillful productive citizens
- Understand the most common criminal events and communicable diseases in prison

Course Content:

1. Introduction to Prison Health
2. Standards in Prison Health
3. Protecting and Promoting Health in Prison
4. Primary Health Care in Prisons
5. Prison Specific Ethical and Clinical Problems
6. Prevention of Common Infectious Diseases in Prisoners
7. Special Health Requirements for Female Prisoners
8. Prevention of Violence and Trauma Among Prisoners
9. Vocational Training Opportunities
10. Treatment of Mental Ill Health Among Prisoners

Recommended Reading:

1. Micheal Puisis Clinical method in correctional Medicine Elsevier incorporation
2. Keith Soothill Prison & Health WHO Hand book of Forensic Mental Health

5.2 International Health

Learning Outcomes:

After studying this course, you should be able to:

- Familiarize the students regarding the international rules and regulations for travelers about the common internationally communicable diseases
- To know the restrictions imposable on travelers
- Describe the importance of culture, class, and gender on perceptions of health and illness, on health status, and on access to services
- Describe the health situation of a country using the concepts of demographic and epidemiological transition
- Delineate the difference between population-based and clinical approaches to health improvement and why population-based approaches are more effective in resource poor settings
- Explain how international health status is measured and communicated
- Discuss the ethical issues implicit in conducting research in the developing world
- Identify the key players in international public health
- Basic principles of international health, in order to give them a better understanding of the wider context of health systems and public health across various countries

Course Content:

1. Introduction to the Concept of International Health

2. International Health Organizations
3. Strengthening Health Security by implementing the international health regulations
4. Global System for Alert and Response
5. IHin Context of Multi-Hazard Dimension
6. Country Capacity Building for International Health
7. International Travel, Health & Mass Gatherings
8. Public Health at Ports, Airports, Entry and Exit Points on Borders
9. IHR Procedure and Implementations

Recommended Readings:

1. Necil Nathansona Global Public Health
2. Anne Emanuelle Bim Textbook of International Health, Global health in dynamic world, 3rd Edition
3. Michael, Robert, Anne International Public Health

5.3 Health Economics

Learning Outcomes:

After studying this course, you should be able to:

- Interpret and appropriately apply the key concepts of economics within the context of the health system
- Debate the relative merits of equity considerations in setting priorities for a health system
- Understand approaches to identify and value costs and outcomes to include in economic evaluation
- Describe major types of economic evaluation and to understand their use in the decision-making process
- Recognize and apply key steps in critically reviewing economic evaluations
- Understand and describe the main features of the Australian health system- in particular how it differs from other salient national health systems according to how services are delivered and purchased
- Write concise reports on health economic issues demonstrating sound knowledge and skills to apply analytic thinking for a scientific debate and/or problem solving

Course Content:

1. Importance of Economics in Health System
2. Growth of Health Economics
3. Economic Principles
4. Wealth and Health
5. Health Needs Analysis
6. Health Sector Demands
7. Health Supplies
8. Cost Analysis
9. Cost Benefit Analysis
10. Cost Minimization Analysis
11. Cost Effectiveness Analysis
12. Cost Utility Analysis
13. Break Even Analysis
14. Uncertainty
15. Marginal Analysis
16. Economy of Health System of Pakistan

Recommended Readings:

1. Pearson The Economics of Health & Health Care, Folland, Goodman, Stano, 5th edition
2. David Kernick, Radcliffe Getting Health Economics into Practice, Medical Press
3. Kumaranayake, Normand Health Economics, MCPAKE, Routledge London & N.Y.

5.4 Health Financing

Learning Outcomes:

After studying this course, you should be able to:

- Orient students about the mechanism of financial resources and its disbursement
- Generate house based resources on health spending
- To enable the students to prepare quarterly and annual demands and financial reports

Course Content:

1. Overview of Health Financing
2. Sources of Health Financing
3. Sources and Mechanism of Health Financing in Pakistan
4. Quarterly and annually financial plans, inventories and auditing
5. Comparison of Health Finances in Global Perspective
6. Relationship Between Financing Instruments and Goals
7. Framework of Healthcare in Pakistan
8. Domestic Spending and Donor Assistance Comparisons
9. Effect of Devolution on Health Financing
10. Financing District Health Services
11. Role of Private Sector, Traditional Medicine and Ngo's
12. Models of health care services
13. Patients satisfaction

Recommended Readings:

1. Diane McIntyre Health Care Financing in Low & Middle-income countries
2. ECNEC & Budgeting Documents of Government of Pakistan
3. An introduction to Financial Management
4. A practitioner guide Health Financing World Bank.

5.5 Health Inventory Management

Learning Outcomes:

After studying this course, you should be able to:

- Optimize Inventory Levels
- Build an Inventory Management Plan
- Design & Manage Warehouse Operations
- Management of "in" & "out" record
- Increase Accuracy, Traceability & Reduce Parts Variety
- Reserved stock and reserved stock limit

Course Contents:

1. Introduction to Inventory Management
2. The Financial Implications of Holding Inventory: Inventory Carrying Cost, Effect on Financial
3. The Cost of not holding enough Inventory

4. Introduction to Effective Inventory Management
5. Inventory Management & the Supply Chain Strategy
6. Demand Forecasting
7. Lead time Management
8. Introduction to Inventory Planning
9. Inventory Categorization Techniques: ABC Analysis, Fast & Slow Moving, Excess, Obsolete & Defective Stocks
10. Traceability and Variety Reduction
11. Inventory Coding Systems and bin card management
12. The Inventory Management Plan
13. Introduction to Inventory Operations
14. Monitoring Movements: Inventory Accuracy
15. Measuring and Valuation of Inventory
16. Receipt & Issuance of Inventory
17. Systems to Replenish Inventory
18. Order planning (time, value & quantity)
19. Storage of vaccines and perishable items
20. Inventory management of disposables

Recommended Books:

1. Essentials of Inventory Management, by Max Muller (Basic Inventory Control)
2. Warehouse Management: A Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse, by Gwynne Richards (Warehouse and Material Handling)
3. Supply Chain Network Design: Applying Optimization and Analytics to the Global Supply Chain, by Michael Watson et al (Distribution Management)
4. Inventory Accuracy: People, Processes, & Technology, by David J. Piasecki (Inventory Accuracy)
5. Inventory Strategy: Maximizing Financial, Service and Operations Performance with Inventory Strategy, by Edward Frazelle (Inventory Strategy)
6. Introduction to Materials Management, by Steve Chapman et al (Material Management)

5.6 Disaster Management

Learning Outcomes:

After studying this course, you should be able to:

- Basic Disaster Concepts
- Planning for disaster management
- Post disaster rehabilitation
- Disaster's effects on economy and health
- Students will recognize basic principles of public health as they relate to disaster management.
- Students will be able to apply critical thinking and decision making skills for given disaster scenarios.
- Students will identify and use appropriate concepts, theories, and principles towards the development of disaster preparedness and mitigation plans.

Course Content:

1. Concept of Disaster
2. Types of Disaster
3. Effect of Disaster on Health
4. Elements at Risk in Disaster

5. Disaster Management Cycle
6. Role of Public Health in Disaster
7. Role of NDMA in Managing Disaster
8. Health Education for Disaster Safety
9. Public Health Review
10. Interdisciplinary Disaster Planning
11. Community Level Preparedness
12. Disaster Mitigation and Post-Event Response
13. Risk Communications
14. Environmental Health Degradation
15. Mental Health Challenges of a Disaster
16. Monitoring and Evaluation of Recovery Efforts

Recommended Readings:

1. B. Narayan Disaster Management APH
2. Dr. S.R. Singh Disaster Management APH

5.7 Quality Management in Health care

Learning Outcomes:

After studying this course, you should be able to:

- Improve the quality of medical and behavioral healthcare
- Maintain a process for adopting and updating both preventive health guidelines
- Identify, develop and enhance activities that promote member safety and reduction in medical errors
- Ensure that quality of care and service delivered by delegates meet standards
- Document and report the results of monitoring activities

Course Content:

1. Introduction to Quality Management in Health
2. Evolution of Quality and its Standards
3. Quality Healthcare
4. Characteristics of Quality
5. Dimensions of Quality
6. Quality Principles
7. Quality Cycle & Circle
8. Quality Audit of Healthcare Services

Recommended Readings:

1. Willson Quality gurus in Health
2. Heizer & Nathan Total Quality Management, Manufacturing and Services
3. Ellen J. Gaucher & Richard J. Coffey Total Quality in Health Care
4. EFQM training/workshop workbook Quality Management in International Health Heidelberg University Germany

5.8 School Health

Learning Outcomes:

After studying this course, you should be able to:

- Describe the components of school health

- Review history of school health
- Develop school health program
- Establish role of personnel
- Delineate Roles and Responsibilities for the Safe Delivery of Specialized Health Care

Course Contents:

1. Objective of school health services
2. School health team
3. Duties of School medical officer
4. Duties of School health nurse
5. Medical inspection of school children
6. Common school health problems
7. Infactuis diseases in schools
8. Healthy school environment
9. Role of teacher in school
10. School health services on Pakistan
11. Models of school health services
12. The Health Needs of School-Age Children
13. School health education program, Planning and implementation

Recommended Readings:

1. UNESCO Pakistan School Health Program
2. NCHD School Health Program
3. Jerry Newton, Richard Adams The New School Health Handbook: A Ready Reference for School Nurses and Educators, 3rd Edition
4. Social Action Programme, Pakistan 1990
5. National Health Survey, Pakistan 1989
6. WHO (1990) Towards a better future, MCH, Geneva

5.9 Health Information System

Learning Outcomes:

After studying this course, you should be able to:

- To familiarize the students with the basic concepts of health MIS
- To expose the students to the health information data collection, analysis and interpretation techniques
- To provide the stakeholders basic vital/health information for decision making

Course Contents:

1. Introduction to Health MIS
2. Contribution of Information technology
 - The strategy network in Health Care organizations
 - Information strategy related to Enterprise and organizational strategies
3. Organizational Accountability
 - Integration of clinical strategy with business strategy
 - Information strategy ; Clinical Decision support system
 - Aligning information strategy with clinical strategy
4. Information Strategy empowers organizational strategy, Managing data, Information and Knowledge
5. Information strategy ; Managing information resources

6. Investing in Information technology
7. Managing Information technology services
8. Information Security and ethics
9. Building Health care Information infrastructure

Recommended Readings:

1. Gordon. D Brown, Tamara T. Stone, Timothy B Patrick - Strategic management of Information systems in Health care (BK-1)
2. www.who.hmis

5.10 Health Project Management

Learning Outcomes:

After studying this course, you should be able to:

- Understand project management concepts/techniques and how they improve the success of information technology projects.
- Demonstrate knowledge of project management terms and techniques, such as:
 - The project management knowledge areas and process groups
 - The triple constraint of project management applied to a healthcare environment
 - The project life cycle
 - Tools and techniques of project management, such as:
 - Project selection methods
 - Work breakdown structures
 - Cost estimates
 - Earned value management
 - Motivation theory and team building
- Be familiar with Project Management tools / techniques and be able to help plan and manage a project.

Course Content:

1. Introduction to Project Formulation
2. Preparing for project formulation
3. Analyzing the organizational situation
4. Analyzing the Health, Socioeconomic and Demographic situation
5. Analyzing and projecting the problems
6. Setting the objectives and targets
7. Identifying potential obstacles
8. Designing the strategies
9. Planning the project
10. Writing the project proposal
11. Initiating the project implementation
12. Specifying and scheduling the work
13. Clarifying authorities, responsibilities, and relationships
14. Obtaining resources
15. Directing and controlling
16. Terminating the project

Recommended Reading:

1. WHO Health Project Management a manual of procedures for formulating and implementing health projects by J. Bainbridge
2. Martin Van Der Schouw Practical Project Management
3. David Shirlay Project Management for Health Care

5.11 Art and Public Health

Learning Outcomes:

After studying this course, you should be able to:

- Develop an understanding of the theoretical foundations that inform the field of arts in medicine and practice of the arts in community health programs
- Understand the roles of the arts in promoting health education, health literacy and disease prevention in community settings
- Develop understanding of the knowledge and skills necessary to engage the arts in a health context
- Develop professional-level practical skills in using the arts to address health in both healthcare and community settings
- Achieve an advanced level of understanding of arts in public health practice
- Gain experience in and develop understanding of the administrative structures that support arts in public health programs and initiatives
- Understand core issues, contemporary trends, critical debates, and research central to the arts in public health
- Identify core competencies including ethical frameworks, program development and assessment, grant writing, and cultural competency

Course Contents:

1. International coverage of creative arts demonstrates their role in very contrasting societies around the world
2. Illustrates how implementing creative arts practices in the promotion of health and wellbeing is compatible with evidence-based practices
3. Introduces the role of the arts across the whole life-span, from birth to the end of life
4. Demonstrates the value of the arts in different social settings communities, schools, hospitals, prisons
5. Offers detailed case studies of creative arts practice in promoting wellbeing and health
6. Use of Music and Films to teach health

Recommended Readings:

1. Stephen Clift, Paul M. Camic Oxford Textbook of Creative arts, Health & Well being.
2. Raymond MacDonald & Gunter Kreutz Music Health & Well being.

6.12 Community Dentistry

Learning Outcomes:

After studying this course, you should be able to:

- Fundamental knowledge of the philosophy, principles, and practices of Dental Public Health.
- Specialized knowledge and skills for practicing Dental Public Health, including research, administration, and teaching

Course Contents:

1. Plan oral health programs for populations.
2. Select interventions and strategies for the prevention and control of oral diseases and promotion of oral health.
3. Develop resources, implement, and manage oral health programs for populations.
4. Incorporate ethical standards in oral health programs and activities.
5. Evaluate and monitor dental care delivery systems.
6. Design and understand the use of surveillance systems to monitor oral health.
7. Communicate and collaborate with groups and individuals on oral health issues.
8. Advocate for, implement, and evaluate public health policy, legislation, and regulations to protect and promote the public's oral health.
9. Critique and synthesize scientific literature.
10. Design and conduct population-based studies to answer oral and public health questions.

Recommended Readings:

Geoffrey L. Slack, Brian A. Burt Dental Public Health: Introduction to Community Dentistry

1. Robert Ireland Textbook of Clinical Hygiene & Therapy
2. Health Council of Netherland Perspectives on oral health care
3. N. Michigan Ave American Dental Hygiene Association Dental Hygiene Education.

5.13 Community Psychiatry

Learning Outcomes:

After studying this course, you should be able to:

- Genetic factors and Physical constitution of prevention psychiatry
- Understand psychosomatic and somatopsychic interaction
- Organic states
- Effective disorder and Management of psychiatric disorder in Pakistan

Course Contents:

1. Organizations of community mental health
2. Severe mental disorder
3. Etiology mental illness
4. Classification of psychiatric disorder
5. The magnitude of mental illness in Pakistan
6. Common community mental health problems in Pakistan
7. Community psychiatric health problem in the light of WHO report 2001
8. Prevention of mental illness
9. Operation of community psychiatry
10. Community psychiatry Team

Recommended Reading:

1. Hunter L. McQuishon & Others Handbook of Community Psychiatry
2. Anderson E.W. Psychiatry Tindall & Cox Ltd. London
3. Gelder. Gath & Mayou Oxford Textbook of Psychiatry

5.14 Community Nursing

Learning Outcomes:

After studying this course, you should be able to:

- Understand and differentiate between community and clinical nursing
- Current nursing trends
- Leadership and communication
- Legal practices in nursing in community nursing care
- Role of Community Health Nursing in district health setup

Course Contents:

- 1 Concepts of Community Health Nursing.
- 2 Rules and functions of Community Health Nursing.
- 3 Family Health Nursing.
- 4 Three ways Florence Nightingale influenced the department of nursing history, contribution of early civilization to care of sick
- 5 Discipline of nursing, what is nursing, definition of nurses functions, major nursing theories
- 6 Nursing trends and issues, 100 year debate. accelerating change, nursing education, responding to an inevitable future
- 7 Leadership for an era of change, nursing autonomy, a leader among leaders, perspective of power
- 8 Ethical issues in nursing and health care / what creates ethical dilemmas. factors that influence ethical decision making theories, codes of ethics
- 9 Legal aspects of nursing practice. Litigation trends in health care. application of legal principles
- 10 Management of nursing services. the evolving practice of nurse executives
- 11 Organization of nursing patient care. The nursing department division. Patient care department division.
- 12 Changing health care, delivery methods, services line models. patient focused care, emerging models for nursing care delivery.

Recommended Readings:

1. Marjorie Beyers The Management of Nursing Services D-18
2. L.Y. Kelly & L.A. Joel The Nursing Experience D-8
3. B.T. Basavanthappa - Community Health Nursing.D-10

5.15 Food Safety

Learning Outcomes:

After studying this course, you should be able to:

- Manage systems for good personal hygiene;
- Control food allergens and food hazards within the business;
- Maintain an effective incident management system;
- Explain the characteristics of poorly constructed water wells;
- Design and operate a system to minimize the risk of pest-infestation in both product and facility;
- Follow safe practices in food preparation areas to avoid accidents;
- Understand the role and influence of the manager on the food safety operation team.

Course Contents:

1. Sanitation & Food Industry
2. The relation of micro organism
3. The relation of Allergen to sanitation
4. The relation of food contamination
5. Personal hygiene & sanitary food handling
6. Role of cleaning compounds in food safety
7. Sanitizers
8. Dairy process plant sanitation
9. Fruit & vegetable sanitation
10. Beverage plant sanitation
11. Butcher sanitation
12. Street food hawkers sanitation\
13. Time & Temperature control
14. Personal hygiene in food professionals
15. Cross contamination prevention
16. Toxic chemicals & Pest control

Recommended Readings:

1. Manual of Food Safety USDA, FSIS Corporate Agreement
Restaurant X - Food Safety Training Manual
2. WHO Nutrition and Food Safety in Pakistan

5.16 Health Marketing

Learning Outcomes:

After studying this course, you should be able to:

- Understand the basic marketing principles
- 04 Ps of marketing
- Advertisement and promotion
- Ethics in marketing
- To understand and describe the principles of marketing and their application in health and health care
- To understand the strategic role of marketing in organizations Strategic
- To apply marketing approaches, tools and techniques in analyzing and solving marketing issues
- To understand the differences and similarities of marketing approaches and tools and their application in private and public health settings, including the use of social marketing
- Explore and analyze current and future marketing issues and trends related to health and health care
- Develop a marketing plan for an organization
- To effectively communicate marketing related concepts and strategy
- Have an understanding of marketing and the marketing planning process.
- Have an understanding of the essential components of marketing strategy formulation in the healthcare environment.
- Have an overall understanding of the effect that marketing has on a health care organization's long-term success.
- Understand the internal and external factors that influence consumer decision making related to healthcare.

- Familiarize students with Marketing of Healthcare services in the Kingdom.
- Understand and Develop marketing strategies aimed at satisfying customer demands and preferences in a health care environment.

Course Contents:

1. Basic understanding of marketing
2. Social, societal and health marketing
3. The History of Marketing in Healthcare
4. Health care administration and marketing
5. Strategic marketing
6. Sale promotion and advertisement
7. Budgeting and financing
8. Marketing and the Healthcare Organization
9. Healthcare Products and Services
10. Emerging Marketing Techniques
11. Marketing Research in Healthcare

Recommended Reading:

1. Philip Kotler Marketing Management Pearson Education/PHI, 2003.
2. Kotler & Keller Service Marketing Management
3. Richard K. Thomas. (2010). Marketing Health Services: Second Edition. Foundation of the American College of Healthcare Executives.
4. John L. Fortenberry Jr. (2010). Heath Care Marketing: Tools and Techniques, Third Edition. Jones and Bartlett.
5. Croufer & Simon (2009). Putting Patients At The Center of A New Business Model. Prism.

5.17 Addiction and Social Rehabilitation

Learning Outcomes:

After studying this course, you should be able to:

- Understand the basic concepts of Addiction and social rehabilitation in practice
- Community diagnoses for addiction
- Substances of abuse
- Pattern of drug uses
- ICD 10 Criteria
- Social psychology of Addiction
- Demand for Addiction Treatment
- Care Planning and Management
- Treatment of Opiate Addiction
- Treatment of Non-Opiate Addiction
- Addiction Treatment in the Criminal Justice System
- Social Support and Reintegration
- Co-ordination and Monitoring of Strategy
- Rehabilitation practices and harm reduction

Course Contents:

1. Introduction to Counseling and Rehabilitation
2. Ethical and Legal Aspects of Substance Abuse and Rehabilitation Counseling

3. Psychiatric Rehabilitation
4. Counseling Theories in Addiction and Rehabilitation
5. Counseling Theories in Addiction and Rehabilitation
6. Prepracticum in Substance Abuse and Clinical Counseling
7. Substance Abuse Counseling
8. Human Growth and Development in Addictions and Rehabilitation Counseling
9. Rehabilitation Evaluation (i.e. Assessment)
10. Treatment of Drug and Behavioral Addictions

Recommended Reading:

1. Neil T. Anderson Overcoming Addiction Behavior
2. Anne M. Fletcher Inside Rehab

5.18 Nuclear Medicine

Learning Outcomes:

After studying this course, you should be able to:

- Understand the basic knowledge of nuclear radiation
- Source of nuclear radiation
- Hazards to exposure
- Positive role in medical and other industries

Course Contents:

1. Introduction to nuclear medicine
2. Exposures to nuclear material
3. Origin & nature of Radiation
4. Terrestrial Radiation
5. Man made source of Radiation
6. Problems of nuclear radiation
7. Biological effects of radiation
8. Radiation effects
9. Evolution of permissible doses
10. Protection from radiation
11. Use in medical diagnostic and therapeutics
12. Radioactive waste disposal
13. Safety & regulatory control

Recommended Reading:

1. ICRP Publication 8. The evaluation of Risks from Radiation
2. Knoll Nuclear Radiation Detection
3. United States Atomic Energy Commission, Medical Aspects of Radiation Accidents, 1963
4. Donald R. Bernier Nuclear Medicine Published by Mosby
5. M. Ilyas Public Health and Community medicine

5.19 Sports Medicine

Learning Outcomes:

After studying this course, you should be able to:

Understand basic concepts of sports medicine;

- Medical supervision and care of athlete
- Physical education (Special and adapted)
- Exercise for prevention of chronic degenerative disease
- Therapeutic exercise in the treatment of physical disorder of disease
- Understand the basic structure of muscles, nerves and bones and its prevention during sports activities
- Basic exercises to strengthen the muscles
- Understand the relationship between brain and body

Course Contents:

1. The history of Sports medicine
2. Physiology of Physical Fitness
3. Nutrition of the Athlete
4. Special care of the Athlete
5. Special consideration of female athlete
6. Role of sports physician in the practice of sports medicine
7. Rehabilitation
8. Ergogenic AIDS/DOPING

Recommended Reading:

1. Ryan AJ, Allman Jr FD Sports Medicine Academic Press New York
2. Davis EC, Logan GA Biophysical values of muscular activity
3. McDonald R, keen CL-Iron, Zinc and Magnesium and Athletic performance Sports Medicine 1988

5.20 Adolescent and Sexual Health

Learning Outcomes:

After studying this course, you should be able to:

- Define and discuss community health, determinants of sexual health, and health advocacy.
- Identify socio-cultural and political barriers, as well as individual barriers, to health, with a focus on sexual health, and strategies to confront those barriers.
- Demonstrate critical thinking skills related to community and sexual health.
- Demonstrate skills of intervention to provide other students with information, options, and resources regarding community and sexual health.

Course Contents:

1. Welcome, introductions, course overview, ground rules, expectations
2. Empowerment, oppression, privilege, social justice
3. Anatomy & Physiology Sexual Response Cycle Menstrual Cycle, Conception, Contraception
4. Sexually Transmitted Infections
5. HIV/AIDS
6. Sexual Assault
7. Gender, Sexual Orientation, Heterosexism & Homophobia
8. Technology & Sexuality
9. Relationships & Communication
10. Body Image, Media & Sexuality

Recommended Reading:

1. Josefina J. Card & Tabitha Benner Adolescent Sexual Health Education An Activity Source Book

2. Andrew L. Cherry International Handbook on Adolescent Health and Development the public health program

5.21 Risk Management

Learning Outcomes:

After studying this course, you should be able to:

- Describe general principles and concepts of enterprise risk management
- Explain basic legal concepts associated with health care risk management
- Describe key structural elements of a risk management program
- List the steps in the risk management process
- Explain risk exposures related to documentation and the medical record
- Describe the concept of risk financing, insurance and claims administration
- Explain risk exposures associated with occupational health, safety and the environment
- Analyze a comprehensive risk management and patient safety program

Course Contents:

1. Risk management understanding and assessments
2. Types of Risks
3. OT risk management
4. Clinical laboratory and radiation risk management
5. Hospital waste risks
6. Development of a Risk Management Program
7. The Process of Professional Regulation
8. Identification of Organizational Risks and Ethics
9. Risk Financing Insurance

Recommended Readings:

1. Risk Management Handbook for Health Care Organizations: Student Edition, Roberta Carroll (Editor). American Society for Healthcare Risk Management. Published by Josey-Bass, 2009

Additional resources will be assigned via University's internet learning platform (Sakai)

5.22 Geriatrics

Learning Outcomes:

After studying this course, you should be able to:

- Understand the concept of geriatric studies
- Aging and theories
- Basic concepts of geriatric ailments
- Management practices of geriatric disorder

Course Contents:

1. Introduction to geriatrics Gerontologic Assessment
 - Mechanisms of Ageing
 - Doctor Patient relationship
 - History Taking and physical examination
2. Theories of aging Physiology of aging; myths surrounding aging; age-related changes in cardiovascular system, respiratory system, urinary system, gastrointestinal system
3. Healthy Ageing Health Promotion and ageing
4. Psychiatric and Behavioural Issues Common psychiatric Disorders
5. Neurological Conditions

- Falls
 - Neurodegenerative conditions
 - Dementia
 - Alzheimer's
 - Confusional States
6. Special Issues
- Medical Conditions Chronic diseases
 - Systems approach endocrine, reproductive, immune)
 - ENT and Eye Conditions
7. Nutritional Needs
8. Ethical issues
9. Rehabilitation of elderly patient Palliative Care

Recommended Readings

1. Ranjit N Ratnaike Practical guide to geriatric Medicine (BK 1)
2. Gerontology Care Complied Notes (BK 2)
3. OP Sharma Geriatric Care; Viva Books Private Limited (BK 3)
4. CS Kart The Realities of Aging: An introduction to Gerontology; publisher Allyn and Bacon, Inc. Boston, MA. 2nd edition (BK 4)
5. Florence, Lieberman, Morris F Collen Aging in Good Health A quality Lifestyle for the Later Years Insight Books
6. Steve Iliffe Linda Patterson, Mairi M Gould Health Care for Older People Mgt in MGP General Practice - BMJ

Prepared by: Dr. Inayat Thaver, Community Health Sciences, BUMDC

Annex 1:**ADDITIONAL REQUIREMENTS AS IDENTIFIED IN ANNEX B PARA 13 TO 17**

	Year1-2020	Year2 2021	Year3 2022	Year4 2023	TOTAL
Program	BSc.	BSc + MSc/MPhil PH	BSc + MSc +FCPS	BSc + MSc +FCPS+PhD	
# of students	BSc 50 2 semesters	100+25 BSc 2 old +2 new Semesters MSc/MPhil PH 3 Semesters	150+50+5 BSc 4 old +2 new Semesters MSc/MPhil PH 2 old +3 new Semesters + FCPS	200+50+0+5 BSc 6 old +2 new Semesters MSc/MPhil PH 2 old +3 new Semesters + FCPS +PhD 3 semesters	200 BSPH 50 MSPH 10 PhD
# of Faculty (Para 13)	7; 1 Prof. 1 Asst. Prof. 3 Lectr. 2 part-time (for English/Math etc)	7 + 5 + All of 1st year + 1 Prof. 1 Asso. Prof 1 Asst. Prof. 3 Lectr.	7+5+ All of 1st & 2nd year + 1 Prof. 1 Asso. Prof 1 Asst. Prof. 3 Lectr.	7+5+6+ All of 1st & 2nd 3rd year + 1 Prof. 1 Asso. Prof 1 Asst. Prof. 3 Lectr.	4 Specified Departments each having 1 Prof 1 Asso. Prof 1 Asst. Prof. 3 Lectr.
	9,600,000	14,600,000	24,600,000	36,600,000	

Facilities for faculty <i>(NOT IDENTIFIED IN SOP OR TAKEN FOR GRANTED)</i>	2 rooms for Prof. 1 big room having cubicles for demonstrators 1 big meeting room for faculty	All of 1 st yr. + 3 rooms for Prof accommodating + Demonstrators in cubicles	All of 1 st & 2 nd yr. + 3. rooms for Prof +accommodating Demonstrators in cubicles	All of 1 st , 2 nd & 3 rd yr. + 3 rooms for Prof. +accommodating Demonstrators in cubicles	Facilities for faculty <i>(all should have basic computer facilities and furniture as of standard)</i>
COSTING	1,200,000 3,600,000	1,800,000	1,800,000	1,800,000	Working Prof room 15x20 =300sq ft Hall for lecturers 40x50 ft = 2000sqft @ pkr 2000 per sq ft
Additional Skilled workers (para 14)	*1 Manager/Director BSPH Program (MBA + adequate experience) *1 Administrative Officer (any Master level with adequate experience of managing audio-visuals and IT support) *1 Laboratory Incharge *1 office boy 1 Librarian with relevant qualifications 1 Assistant Librarian	*1 Manager/ Director MSPH Program (MBA + adequate experience) *1 Administrative Officer (any Master level with adequate experience of managing audio-visuals and IT support) *1 office boy	*1 Research Lab Incharge having IT/ Bio-Statistics experience *1 office boy	*1 Extended CHS Lab. Officer OR Community Mobilizer * 1 Office Boy	4 Managers 1 PhD coordinator 2 Administrative Officers 4 Office boys

COSTING	<p>90,000 60,000 40,000 25,000 50,000 35,000 Total x 12 months x 4 years = 20640000</p>	<p>150000 75000 50000 30000 Total x 12 months x 4 years</p>	<p>75000 30000 Total x 12 months x 2 years</p>	<p>75000 30000 Total x 12 months x 2 years</p>	
Additional class rooms (Para 15)	<p>1 Lecture Hall having capacity of 100 students; 3 Tutorial rooms having capacity of at least 20-25 students ;1 Multi-disciplinary Lab. + <u>Audiovisual facilities; chairs, others</u> <u>Students common room boys + girls</u></p>	<p>All of 1st yr + 1 Lecture Hall; 3 Tutorial rooms; (as of identified in the first year)</p>	<p>All of 1st & 2nd yr + 1 Lecture Hall; 2 Tutorial rooms; (as of identified in the first year)</p>	<p>All of 1st , 2nd & 3rd yrs + 1 Lecture Hall; (as of identified in the first year) 1 room for PhD scholars having capacity of at least 10-15 student with U shaped seating arrangement and audio-visuals + at least 10 cubicles for PhD scholars;</p>	<p>3 lecture halls 8 tutorial rooms</p>

COSTING	Lecture hall size 1500 sq ft Tutorial size 800 sq ft @ pkr 2000 per sq ft Lecture hall -1- pkr 3,000,00 + Tutorial 3- pkr 1,800,000	2000000 1 lectur Hall 3,000,000 + Tutorial 3 1,800,000	1000000 1 lecture Hall 3,000,000 3 tutorial 4 1,800,000	1000000 500000 300000 Lecture 1 3,000,000 Class Room for PhD 1000 sq ft – 1,500,00 + Cubicle s1,000,000	
Additional requirements for labs. (Para 16)	Standard multi-disciplinary lab.		1 Research resource lab Having capacity of at least 50-75 computers and audio-visual with some silent practice rooms	1 extended CHS lab (as of current CHS but with advanced facilities, especially for post-graduates	3 Labs. With mutually exclusive facilities as identified
COSTING	1,000,000		7,000,000	1,000,000	
Additional requirements for Books (Para 17)	A big "Public Health" library having a capacity of at least 100 seats and 10 computer access points + All course and reference Books identified	All course and reference Books identified according to courses and semester in each year +	All course and reference Books identified according to courses and semester in each year +	All course and reference Books identified according to courses and semester in each year +	

	according to courses and semester in each year	Additional Books for Post-graduate levels	Additional Books for Post-graduate levels	Additional Books for Post-graduate levels	
COSTING	5,000,000 Seating cost Computers cost Books cost	500,0000	5000,000	5000,000	
Progress in offering PH courses	Bachelor of Science in Public Health (BSPH)	Master of Science in Public Health MSPH/MPhil	FCPS (Community Medicine)	PhD in Public Health	

REVIEW OF PENALTIES FOR ACADEMIC MISCONDUCT**13.10 Penalties for Academic Misconduct**

13.10.1 A student who is guilty of academic misconduct **during examinations** shall be liable to penalties as tabulated. **These penalties are liable once students have been cautioned prior and during examinations i.e upon issuance of online roll No slips display of adequate No. of notices in and outside examination Halls and pertinent announcements by the invigilators during exams.** Head of the CU/Director Campus is authorized to award all the penalties except rustication and expulsion.

TYPE OF MISCONDUCT	PROPOSED MISCONDUCT BY COMMITTEE	PENALTY	PROPOSED BY BU COMMITTEE
	<p>Attempt to know contents of question paper(s) through unfair means prior to examination.</p> <p><u>CE BU</u></p> <ul style="list-style-type: none"> • Penalty for knowing the contents of question paper(s) through unfair means prior to exams may be segregated for the attempt and the actual Breach of Security, as under: <p>(a). <u>Attempt</u></p> <p>(b). <u>Breach of Security</u></p>		<p>a. Expulsion from the University.</p> <p>b. Fine Rs 5,000.</p> <p>c. Letter to parents.</p> <p><u>CE BU</u></p> <p><u>Attempt</u></p> <p>a. Warning letter (copy to parents)</p> <p>b. Fine Rs.2,000/00</p> <p><u>Breach of Security</u></p> <p>a. Expulsion from the University</p> <p>b. Fine Rs.5000/00</p>

			c. Letter to parents.
<ul style="list-style-type: none"> Possession of written material, relevant or irrelevant to the paper concerned. Writing on palm, arm or anywhere on the candidate's body or clothes whether the written material is relevant or irrelevant to the concerned paper. Possession of Mobile phones, PDAs and other electronics accessories, whether carrying or not any relevant or irrelevant material in the memory. 	<ul style="list-style-type: none"> Possession of written material, relevant to the paper concerned. Writing on palm, arm or anywhere on the candidate's Body (Except tattoos) or clothes whether the written material is relevant or irrelevant to the concerned paper. Possession of Mobile phones, Smart watches, PDAs and other electronics accessories, whether carrying or not any relevant or irrelevant material in the memory. 	<ul style="list-style-type: none"> a. Grade 'F' in the subject. b. Fine Rs 1,500. c. Warning, copy to parents. 	<ul style="list-style-type: none"> a. Grade 'F' in the subject. b. Fine Rs 3,000. c. Warning, copy to parents. d. Mobile phone/ electronic devices to be confiscated. (will be relevant after investigation) BULC? What will be disposal of confiscated items.
<ul style="list-style-type: none"> Giving/receiving assistance or allowing any other candidate to copy from his/her answer books. 	Same	<ul style="list-style-type: none"> a. Cancellation of the relevant paper. b. Fine Rs 1,500. c. Warning, copy to parents. 	<ul style="list-style-type: none"> a. Grade 'F' in the subject. (for student(s) involved) b. Fine Rs 3,000. c. Warning, copy to parents.
<ul style="list-style-type: none"> Removing a leaf from answer book. Taking the whole or a part of an answer book or a continuation sheet into or out of examination hall. 	Same	<ul style="list-style-type: none"> a. Cancellation of the relevant paper. b. Fine Rs 2,000. c. Warning, copy to parents. 	<ul style="list-style-type: none"> a. Grade 'F' in the subject. (for student(s) involved) b. Fine Rs 5,000. c. Warning, copy to parents.
<ul style="list-style-type: none"> Substituting the whole or a part of an answer book or a 	Same	<ul style="list-style-type: none"> a. Grade 'F' in the relevant subject 	<ul style="list-style-type: none"> a. Grade 'F' in the subject. (for student(s) involved)

continuation sheet not duly issued to him for the examination;		b. Fine Rs 2,000. c. Warning, copy to parents.	b. Fine Rs 5,000. c. Warning, copy to parents.
• Forging, mutilating, altering, erasing or otherwise tampering with marked answer scripts.	Same	a. Cancellation of the relevant Paper b. Fine Rs 2,000. c. Warning, copy to parents.	a. Grade 'F' in the subject. (for student(s) involved) b. Fine Rs 5,000. c. Warning, copy to parents.
• Impersonation	Same	a. Grade 'F' in all subjects. b. Expulsion from University. c. Fine Rs 5,000.	a. Grade F in all subjects of relevant semester studied at BU (including the impersonator/facilitators, if a student of BU). b. Expulsion from the university (including the impersonator/facilitators, if a student of BU). c. In case the impersonator/facilitator is an ex-student of BU or not a BU student FIR may be lodged for the offence, as per law of the land.
• Using abusive or obscene language in answer book.	Same	a. Grade 'F' in the relevant course. b. Fine Rs 2,000. c. Warning, copy to parents.	a. Grade 'F' in the relevant course. b. Fine Rs 2,000. c. Warning, copy to parents.

			e. Penalties to be applied after investigation by disciplinary committee report.
<ul style="list-style-type: none"> • Refusing to obey the Invigilator or Head Invigilator in the Examination hall and misbehaving, resorting to misconduct, or creating any kind of disturbance in or around the Examination Hall. 	<ul style="list-style-type: none"> • Refusing to obey the Invigilator or Head Invigilator in the Examination Hall and misbehaving, resorting to misconduct, or creating any kind of disturbance in or around the Examination Hall, if caught for using unfair means. <p><u>BUKC.</u></p> <p>Due any reason</p> <p><u>CE BU</u></p> <ul style="list-style-type: none"> Penalty for refusing to obey the investigator/ head investigator and misbehaving/ resorting to misconduct/ creating any disturbance in/ around Exams Hall may also be segregated for Caught for Using Unfair Means, or Otherwise, as under: 	<ul style="list-style-type: none"> a. Rustication for one semester. b. Grade 'F' in the course. c. Fine Rs 5,000. d. Warning, copy endorsed to parents. 	<ul style="list-style-type: none"> a. Rustication for one semester. b. Grade 'F' in the course. c. Fine Rs 5,000. d. Warning, copy to parents. e. Penalties to be applied after investigation by disciplinary committee report and approved by Rector. <p><u>BUKC</u></p> <p>Approved by DG campus except penalty at para 'A' above.</p>

	<p>a. <u>Caught for Using Unfair Means.</u></p> <p>b. <u>Otherwise.</u></p>		<p>CE BU</p> <p><u>Caught for Using Unfair Means.</u></p> <p>a. Rustication for one semester with Grade F</p> <p>b. Fine Rs.5000/00</p> <p>c. Warning letter (Copy to parents)</p> <p><u>Otherwise</u></p> <p>a. Cancellation of relevant paper</p> <p>b. Fine 2,000/00</p> <p>c. Warning letter (copy to parents)</p>
<ul style="list-style-type: none"> • Communicating or attempting to communicate with Examiners with the intention of influencing them in the award of marks 	Same	<p>a. Grade 'F' in the relevant course.</p> <p>b. Fine Rs 2,000.</p> <p>c. Warning.</p>	<p>a. Cancellation of relevant paper.</p> <p>b. Fine Rs 5,000.</p> <p>c. Warning, copy to parents.</p>
<ul style="list-style-type: none"> • Possession of firearms, knives etc. inside and in the close vicinity of Examination Hall. 	Same	<p>a. Expulsion from the University.</p> <p>b. Fine Rs 5,000.</p>	<p>a. Expulsion from the University.</p> <p>b. Fine Rs 5,000.</p> <p>c. letter to parents.</p> <p>d. Penalties to be applied after investigation by disciplinary committee report and approved by Rector.</p>

COMMENTS OBSERVATIONS BY BUHO OFFICERS	
Registrar	All the penalties must be put before or awarded after investigation by disciplinary committee
BU Legal Advisor	Investigation by Disciplinary Committee and providing the student opportunity of being heard must be condition precedent for award of all penalties

13.10.2 In a situation not covered in Table 10, the seriousness of the offense committed shall be compared with those in the table and penalty awarded accordingly and proportionally.

Appendage 3501

BAHRIA UNIVERSITY, ISLAMABAD
DEPARTMENT OF LAW
FACULTY NAME: DR. MUHAMMAD ASIF KHAN
COURSE OUTLINE

Course Name	Business Ethics and Human Rights	Prepared in	Spring 2020
Course Code	LLM 757		
Credit Hours	3		
Course Prerequisite	Nil	Revised on	
Prerequisite Code	N/A		As per Requirement
Course Type	Elective		
Program	<input type="checkbox"/> LLM & PhD		
Semester	Fall and Spring		

Course Description

“Business Ethics and Human Rights” has emerged over the past twenty-five years as a distinct field of practice and study. Companies are paying greater attention to the human rights risks connected to their businesses and contributing to a growing body of corporate human rights practice. As more individuals in the private sector, government and civil society find themselves managing business and human rights challenges, there is growing demand for lawyers and other advisors who can help companies to manage effectively the human rights impacts of business by adopting human rights policies, conducting human rights due diligence, and exploring ways to prevent, mitigate and remedy actual and potential human rights impacts.

This course is designed to provide students to apply best practices for managing the human rights impacts of business enterprises. This course prepare students to provide sound business and human rights advice, placing them in the shoes of both corporate decision-makers and human rights advocates seeking to influence corporate policies and practices. The seminars addresses key business and human rights issues through in-class exercises and by highlighting the challenges facing companies in different industries, such as the internet, manufacturing, and extractive sectors. It provides an overview of corporate social responsibility (CSR), as a legal matter within states, as a matter of international law and compliance, and as a tool and methodology of corporate governance and finance. It focuses on the contemporary interplay between large corporations and governments, intergovernmental institutions, investors and non-governmental organizations (NGOs).

Course Learning Outcomes

CLO #	Description
1.	Demonstrate a critical understanding of the nature and scope of business' human rights Responsibilities in the light of existing and emerging international human rights law, standards and norms.
2.	Identify the broad substantive legal principles, arguments, critiques and procedural tools used to advance CSR and human rights in the business world.
3.	Analyse the broader social, economic, and political contexts in which issues in the field of business

	and human rights arise.
4.	Appraise the ethical issues and dilemmas faced by corporations confronted with human rights issues.
5.	Apply the knowledge and skills gained from participation in the course to a professional context by evaluating the legal and reputational risk arising from potential human rights violations posed by business operations, and designing business strategies, which address human rights issues.

Teaching & Learning Methodology

- Reading material
- Class discussions
- Debate on selected topics
- Critical analysis of given topics
- Case studies

Grading Policy

	Assessment Instruments	Percentage
Quizzes		10%
Assignments		20%
Mid Term Exam		30%
Final Exam		40%

Week-wise Course Outline

Week / Session	Contents	Activities / Learning Outcome/Readings
1.	Introduction to the Course and Key Resources Sub Topics: Setting the Standard – What are Human Rights?	W.A. Edmondson, An Introduction to Rights, Cambridge (2004). Posner, Michael (2011), “The Four Freedoms Turn 70,” the American Society of International Law’s 105th Annual Meeting, Washington, D.C. Shashi Tharoor, “Are Human Rights Universal?” World Policy Journal Vol. XVI, No.4, Winter 1999/2000 Universal Declaration of Human Rights (1948) Neier, Aryeh, “Asian Values vs. Human Rights”, Open Society Institute
2.	Human Rights Enforcement Mechanism Sub Topics: The UN Human Rights Council The Regional Enforcement The extraterritorial application of Human Rights	Laval, Pierre N. (2013): “The Long Arm of International Law: Giving Victims of Human Rights Abuses Their Day in Court”. Foreign Affairs 92: https://fam.ag/2trPt65 Posner, Michael (2018), “Why U.S. Withdrawal From The Human Rights Council Is A Dangerous Leadership Mistake” https://bit.ly/2GgOuOR Comb, Nancy (2019) The Hill: “The ICC Comes of Age”

	<p>Gerald Neuman, Has the Human Rights Committee Extended Its Reach?, <i>Just Security</i>, July 29, 2015, at https://www.justsecurity.org/25022/human-rights-committee-extended-reach/</p> <p>Committee on Economic, Social and Cultural Rights, General Comment No. 24 on State Obligations under the International Covenant on Economic, Social and Cultural Rights in the Context of Business Activities, UN Doc. E/C.12/GC/24 (June 23, 2017), paras. 25-37, at http://www.right-to-education.org/sites/right-to-education.org/files/resource-attachments/CESCR General comment 24 HR in context of business activities EN.pdf</p> <p>Monica Feria-Tinta, <i>The Rise of Environmental Law in International Dispute Resolution: Inter-American Court of Human Rights Issues Landmark Advisory Opinion on Environment and Human Rights</i>, <i>EJIL TALK!</i>, Feb. 26, 2018, at https://www.ejiltalk.org/the-rise-of-environmental-law-in-international-dispute-resolution-inter-american-court-of-human-rights-issues-landmark-advisory-opinion-on-environment-and-human-rights/</p> <p>Excerpts, Human Rights Committee, General Comment 31 [80], <i>The nature of the general legal obligation imposed on States Parties to the Covenant</i>, adopted Mar. 29, 2004. Please focus especially on paras. 8 and 10, and their implications for the question of how international human rights law addresses human rights violations committed by business enterprises.</p>
3.	<p>The Business case of Human Rights</p> <p>Defining “Corporate Social Responsibility” (CSR) and “Business and Human Rights” (BHR)</p> <p>The Role of Business in Society</p> <p>The Extension of Human Rights Obligations to Multinational Enterprises (MNEs)</p> <p>Milton Friedman, “The Social Responsibility of Business is to Increase its Profits” <i>The New York Times Magazine</i>, Sept. 11, 1970, p.33</p> <p>Mary Robinson, “The Business Case for Human Rights” December 1998 – published in “Visions of Ethical Business”</p> <p>Christopher Avery, Director, Business & Human Rights Resource Centre, “The Difference between CSR and Human Rights” in <i>Corporate Citizen Briefing</i> Aug-Sep 2006, Issue 89</p> <p>Keith Slack, “Putting Teeth into Corporate Social responsibility”, <i>PolicyInnovations.org</i>, November 21, 2006</p> <p>Julian Evans, “Good Intentions”, <i>The Wall Street Journal</i>, February 3, 2010</p>

Peter Muchlinski, "Human Rights and Multinationals: Is there a Problem?" (2001) *International Affairs*, 77, pp. 31-47

Lisa Misol, "Private Companies and the Public Interest: Why Corporations Should Welcome Global Human Rights Rules" Human Rights Watch

Shell Game in Nigeria (editorial), N.Y. TIMES, Dec. 3, 1995, available at <https://www.nytimes.com/1995/12/03/opinion/shell-game-in-nigeria.html>

Eduardo Porter, Corporate Action on Social Problems Has Its Limits, N.Y. TIMES, Sept. 9, 2015, possibly available at <https://www.nytimes.com/2015/09/09/business/economy/corporate-efforts-to-address-social-problems-have-limits.html>

Tom Wilson, How Corporations Can Be a Force for Good, WASH. POST, Sept. 29, 2016, at https://www.washingtonpost.com/opinions/how-corporations-can-be-a-force-for-good/2016/09/29/99268-7ac4-11e6-ac8e-cf8e0dd91dc7_story.html?noredirect=on&utm_term=.9a4154cb61b8,

Jena McGregor & Elizabeth Dwoskin, The Cost of Silence: Why More CEOs Are Speaking Out in the Trump Era, WASH. POST, Feb. 17, 2017, at https://www.washingtonpost.com/news/on-leadership/wp/2017/02/17/the-cost-of-silence-why-more-ceos-are-speaking-out-in-the-trump-era/?utm_term=.6fc3e1e1a7c8

Jagdish Bhagwati, "Do Multinational Corporations Hurt Poor Countries?" *The American Enterprise*, June 1, 2004

M. Monshipouri, C.E. Welch, Jr., and E.T. Kennedy, "Multinational Corporations and the Ethics of Global Responsibility: Problems and Possibilities" *Human Rights Quarterly*, Vol. 25, 2003

Frans-Paul van der Putten, Gemma Crijns and Harry Hummels, "The Ability of Corporations to Protect Human Rights in Developing Countries" Ch. 6 in Rory Sullivan (ed.), *Business and Human Rights, Dilemmas and Solutions*, Greenleaf Publishing, 2003, pp/ 82-91

Sophie Richardson, "In China, Big Companies are Learning the Business of Human Rights", Human Rights Watch, September 17, 2014

4.	<p>Legal Accountability: (a) Criminal Liability (b) Civil Liability</p> <p>Sub-topics: U.S. Alien Tort Statute Claims</p> <p>The impact of <i>Kiobel v Royal Dutch Petroleum</i></p>	<p>Peter Weiss, Op-ed: "Should Corporations Have More Leeway to Kill Than People Do?" <i>New York Times</i>, February 24, 2012</p> <p>John G. Ruggie, "Kiobel and Corporate Social Responsibility" An Issues Brief, Kennedy School of Government, Harvard University, September 4, 2012</p> <p>Shell Response to Professor Ruggie's 'Issues Brief', September 10, 2012</p> <p>Desmond Tutu, "Will U.S. rule for rights of S. Africans?" <i>USA Today</i>, September 30, 2012</p> <p><i>Kiobel et.al v Royal Dutch Petroleum et. al.</i>, Decision of the U.S. Supreme Court, April 17, 2013</p> <p>Brendan Pearson, "High Court Decision in Rejection of Apartheid Liability" <i>New York Law Journal</i>, August 22, 2013</p> <p>Khulumani Support Group, "U.S. Circuit Court dismisses apartheid litigation" Joint Press Release, August 22, 2013</p> <p>Timothy Coleman and Emily Holland, "Touching and Concerning 'Kiobel': Continuing Implications", <i>New York Law Journal</i>, May 18, 2015</p>
5.	<p>Corporate Compliance with Human Rights Responsibilities</p>	<p>M Asif Khan and Pervaiz Khan., Liabilities of Transnational Corporations: Empowering the State Courts against Extraterritorial Wrongs by TNCs, 71 <i>Journal of Law and Society</i> (2017): pp. 23-38.</p> <p>"Injustice Incorporated – Corporate Abuses and the Human Right to Remedy", Amnesty International, (2014), https://www.amnesty.org/en/documents/POL30/001/2014/en/ (Chapters 2 and 4)</p> <p>Jernej Letnar Cernic, Tara Van Ho (eds.), "Human Rights and Business: Direct Corporate Accountability for Human Rights", (2015), Wolf Legal Publishers Chapters 11 and 12.</p> <p>Willem van Genugten, Nicola Jägers, Mariya Gromilova, Evgeni Moyakine, Laura de Vries, "Business and Human Rights Violations: Outcomes of Non-Judicial Dispute Settlement. An Exploratory Report", Center for Transboundary Legal Development, Tilburg University, the Netherlands, 2013</p> <p>Robert McCorquodale and Penelope Simons, 'Responsibility Beyond Borders: State Responsibility for Extraterritorial Violations by Corporations of</p>

		<p>International Human Rights Law', 70 <i>Modern Law Review</i> (2007) 598.</p> <p><i>The Social and Economic Rights Action Center for Economic and Social Rights v. Nigeria</i>, African Commission on Human and Peoples' Rights, Comm. No. 155/96 (2001).</p> <p>International Center of Transitional Justice, A Matter of Complicity? Exxon Mobil on Trial for its Role in Human Rights Violations in Aceh (2008)</p>
6.	Linking CSR, Human Rights, and Business Strategy	<p>Rory Sullivan, "From the inside looking out: a management perspective on human rights, Business and Human Rights," chapter 8 in Rory Sullivan (ed.), <i>Business and Human Rights, Dilemmas and Solutions</i>, Greenleaf Publishing, 2003.</p> <p>Anthony Ewing, "UN Human Rights Framework: What Executives Need to Know and Do about Human Rights", <i>Ethical Corporation</i>, February 17, 2011 and March 11, 2011</p> <p>Michael Porter and Mark Kramer, "Strategy & Society: The Link Between Competitive Advantage and Corporate Social Responsibility" <i>Harvard Business Review</i>, December 2006, pp. 78-92</p> <p>Sheila Bonini, Timothy M. Koller and Philip H. Mirvis, "Valuing Social Responsibility Programs", <i>McKinsey Quarterly</i>, Summer 2009 (Number 32)</p> <p>Sheila Bonini, Lenny Mencoca and Jeremy Openheim, "When Social Issues Become Strategic", <i>McKinsey Quarterly</i> (2006), Issue 2</p> <p>Raymond Brown "BP Executives' Human Rights Miscalculation: Have they Bet the Company?" diversityinc.com, July 26, 2010</p> <p>Econsense, "Respecting Human Rights: Tools & Guidance for Business", November 2014</p> <p>Antony Crockett, "Human Rights Clauses in Commercial Contracts", <i>LSE Investment & Human Rights Project</i>, June 4, 2014</p> <p>Faris Natour, "Advancing Human Rights: Three Lessons for Businesses", The Guardian, September 16, 2015</p> <p>Sue George, "Brand, Reputation and Staff: the Business Case for Social Good" The Guardian, October 15, 2015</p>

7.	<p>Initiatives Intended to Bridge Global Governance Gaps</p> <p>UN Guiding Principles on Business and Human Rights</p> <p>Critiques and Implementation of the UN Guiding Principles</p>	<p>M Asif Khan and Pervaiz Khan., Making Transnational Corporations more Responsible: A Human Rights Approach, 70 <i>Journal of Law and Society</i> (2017): pp. 73-90.</p> <p>United Nations Global Compact</p> <p>United Nations Draft Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights</p> <p>John Ruggie, "Protect, Respect and Remedy: A Framework for Business and Human Rights", Report of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, UN doc. A/HRC/8/5 (7 April 2008)</p> <p>John Ruggie, proposed Draft "Guiding Principles for the Implementation of the United Nations 'Protect, Respect and Remedy' Framework" Report of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, UN doc. A/HRC (22 November 2010)</p> <p>Joint Civil Society Statement on the Draft Guiding Principles on Business and Human Rights, 14 January 2011</p> <p>Hugh Williamson, "Rights groups slam UN plan for multinationals", Financial Times, January 17 2011</p> <p>John Ruggie, "Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework" Report of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, UN doc. A/HRC/17/31 (21 March 2011)</p> <p>Global Reporting Initiative, 'G4 Sustainability Reporting Guidelines' 2015, Part 1 – Reporting Principles and Standards</p> <p>UN Guiding Principles Reporting Framework, 2015</p> <p>Hong Kong Exchange Consultation Paper, 'Review of the Environmental, Social and Governance Reporting Guide' July 2015</p> <p>Cragg, "Ethics, Enlightened Self-Interest, and the Corporate Responsibility to Respect Human Rights," A</p>
----	--	---

		Critical Look at the Justificatory Foundations of the UN Framework," <i>Business Ethics Quarterly</i> , 22 (January 2012) Wood, "The Case for Leverage-Based Corporate Human Rights Responsibility," <i>Business Ethics Quarterly</i> , 22 (January 2012)
8.	Revision	
9.	MID-TERM EXAMS	

10.	Human Rights in the Workplace International Labour Rights and Standards Supply Chain Management Child Labour, Sweatshops and Human Trafficking	Peter Muchlinski, <i>Multinational Enterprises and the Law</i> , (2 nd edition, 2007), Oxford University Press, chapter 12 "Labour Relations" International Labour Organisation (ILO)'s Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy, 2006 OECD Guidelines for Multinational Enterprises – 2011 Edition (Chapter V Employment and Industrial Relations, pp.35-41): United Nations Convention on the Rights of the Child, Articles 31 and 32 Deborah Leipziger and Eileen Kaufman, "SA 8000: Human Rights in the Workplace" (chapter 15 in Rory Sullivan, ed., <i>Business and Human Rights: Dilemmas and Solutions</i>) Rachel Wilshaw et. al, "In Work but Trapped in Poverty", Oxfam, September 2015 Justice Centre Hong Kong and Liberty Asia, "How Many More Years a Slave?" March 2014: available at: http://www.justicecentre.org.hk/framework/uploads/2014/03/JCHK_Report_final_spreads.pdf Nicholas Kristof and Sheryl WuDunn, "Two Cheers for Sweatshops" <i>The New York Times Magazine</i> , September 24, 2000. Paul Krugman, "In Praise of Cheap Labor," 1997 Bahar Ali Kazmi and Magnus Macfarlane, "Elimination of child labour: Business and local communities" (chapter 14 in Rory Sullivan, ed., <i>Business and Human Rights: Dilemmas and Solutions</i>) Julia Finch, "Foxconn pay rises help lift wages in China and that can only be good" <i>The Observer</i> , October 3, 2010
-----	--	---

		<p>Tania Branigan, "Apple Report reveals child labour increase", <i>The Guardian</i>, February 15, 2011</p> <p>David Barboza, "In China, Human Costs are Built into the Costs of an iPad", <i>The New York Times</i>, January 25, 2012</p> <p>Felicity Lawrence, "Costco and CP Foods face lawsuit over alleged slavery in prawn supply chain", <i>The Guardian</i>, August 19, 2015</p>
11.	<p>Health, Business and Human Rights</p> <p>Pharmaceutical Corporations and Access to Drugs</p> <p>Clinical Trials in Developing Countries</p>	<p>UN Commission on Human Rights, ESCR Report of the Special Rapporteur, Paul Hunt, "The Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health" E/CN.4/2003/58, February 13, 2003</p> <p>UN Human Rights Council, Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health, Anand Grover, United Nations A/HRC/11/12, March 31, 2009</p> <p>UN Human Rights Council: Anand Grover, "Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Health – Expert Consultation on Access to Medicines as a Fundamental Component of the Right to Health" United Nations A/HRC/17/43, March 16, 2011</p> <p>UN Human Rights Council: Anand Grover, On Access to Medicines "Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health" United Nations A/HRC/23/42, 1 May 2013</p> <p>UN Human Rights Council: Anand Grover, "Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health" United Nations A/69/299, August 11, 2014 <u>paragraphs 36-47</u></p> <p>Sarah Joseph, "Pharmaceutical Corporations and Access to Drugs: The 'Fourth Wave' of Corporate Human Rights Scrutiny" <i>Human Rights Quarterly</i>, Vol. 25 (2003) pp. 425-452</p> <p>Sofia Gruskin and Zde Raad, "Are Drug Companies Living Up to Their Human Rights Responsibilities? Moving Toward Assessment" <i>PLoS Medicine</i> 7(9), September 28, 2010</p> <p>Geralyn S. Ritter, "Are Drug Companies Living Up to Their Human Rights Responsibilities? The Merck Perspective" <i>PLoS Medicine</i> 7(9), September 28, 2010</p>

		<p>Khosla and Hunt, "Are Drug Companies Living Up to Their Human Rights Responsibilities? The Perspective of the Former United Nations Special Rapporteur (2002-2008)" <i>PLoS Medicine</i> 7(9), September 28, 2010</p> <p>Rajarshi Banerjee, "The Success of and Response to, India's Law against Patent Layering" <i>Harvard International Law Journal</i>, vol. 54, May 2013</p> <p>Fran Quigley, "The TPP's Bad Medicine" <i>Foreign Affairs</i>, July 13, 2015</p> <p>Fran Quigley, "The Trans-Pacific Partnership and Access to Medicines, <i>Health and Human Rights Journal</i>, June 18, 2015</p> <p>Simon Henry-Reid, "Pharmaceutical Companies Putting Health of World's Poor at Risk", <i>The Guardian</i>, Poverty Matters Blog, July 26, 2012.</p> <p>Joseph Stiglitz and Arden Jayadev, "India's Patently Wise Decision" <i>The Jordan Times</i>, May 2, 2013</p> <p>Mark Kramer, How Global Healthcare Firms are Finding New Ways to Create Shared Value" <i>The Guardian</i>, October 3, 2011</p> <p>Sarah Boseley, "Drug Companies Join Forces to Combat Deadliest Tropical Diseases" <i>The Guardian</i>, January 30, 2012</p> <p>Henry Zakumumpa, "Big Pharma Problem for HIV/AIDS" <i>Independent</i>, Uganda, June 13, 2013</p>
12.	<p>The Environment, Business and Human Rights</p> <p>The Extractive Industries</p>	<p>The Rio Declaration on Environment and Development, Report of the United Nations Conference on Environment and Development, 1992</p> <p>UN Framework Convention in Climate Change, 1992</p> <p>The Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998</p> <p>Peter Muchlinski, <i>Multinational Enterprises and the Law</i>, (2nd edition, 2007), Oxford University Press, chapter 14 "Environmental Issues"</p> <p>Amnesty International and Human Rights Watch Joint Statement on the Rio + 20 UN Conference on Sustainable Development, June 12, 2012</p> <p>OHCR and UNEP: "Human Rights and the Environment – Rio + 20: Joint Report of OHCR and UNEP", June 19, 2012</p> <p>OECD Guidelines for Multinational Enterprises, 2011 Edition, Chapter VI - "Environment" pp. 42-46.</p>

		<p>UN Human Rights Council, Report of the Independent Expert on the issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment, John H. Knox, December 30, 2013, A/HRC/25/53</p> <p>John H. Knox, <i>Greening Human Rights</i>, Open Democracy, July 14, 2015</p> <p>Mary Robinson, "Climate Justice and Business: Human Rights from the frontlines to Paris" Mary Robinson Speaker Series on Business and Human Rights, 23 September 2015</p> <p>Juliette Jowit "Time to Clean Up: UN Study reveals environmental cost of world trade" <i>The Guardian</i>, February 19, 2010</p> <p>Olivier De Schutter, "Climate Change is a Human Rights Issue – and that's how we can solve it" <i>The Guardian</i>, April 24, 2012</p> <p>"Dirty Laundry: Unravelling the corporate connections to toxic water pollution in China" Greenpeace International, July 13, 2011 - Executive Summary</p> <p>"Dirty Laundry: Reloaded" Greenpeace International, March 20, 2012 - Executive Summary</p> <p>Xan Rice, "Environment: Pollution a Threat to Health in Ogoniland" <i>Financial Times</i>, July 23, 2012</p> <p>Dominic Rushe, "Deepwater Horizon: BP got 'Punishment it Deserved' Loretta Lynch say" <i>The Guardian</i>, October 5, 2015</p> <p>Matt McGrath, "Paris Climate Summit: Major Oil Producers Back 'Effective' Deal, BBC News, October 16, 2015</p> <p>Emily Atkin, "Exxon's Climate Cover-Up should be Investigated by DOJ, Tobacco Prosecutor Says", <i>Climate Progress</i>, October 20, 2015</p> <p>David Hasemeyer and John Chushman, "Exxon Sowed Doubt about Climate Science for Decades by Stressing Uncertainty" <i>Inside Climate News</i>, October 22, 2015</p> <p>Bernhard Rieger, "The End of the People's Car – How Volkswagen Lost its Corporate Soul", <i>Foreign Affairs</i>, October 4, 2015</p>
13.	The Role of Business in Developing Countries Foreign Direct Investment	World Wildlife Fund, "Searching for the Holy Grail? Making FDI work for Sustainable Development", Analytical Paper, March 2003

Tax and Transparency The Banking Industry	<p>The Equator Principles III, 2013</p> <p>The EITI Principles, Extractive Industries Transparency Initiative, EITI Standard, July 2013</p> <p>OECD, "Tax and Development: Draft Principles to Enhance the Transparency and Governance of Tax Incentives for Investment in Developing Countries"</p> <p>OECD Report to G20 Development Working Group on the Impact of BEPS in Low Income Countries, (Parts 1and 2), July 2014 and August 2014</p> <p>Global Witness, "Anonymous Companies" December 2013</p> <p>Open Society Foundations, "Terrorism, Inc. How Shell Companies Aid Terrorism, Crime and Corruption, 2013</p> <p>The Democracy Center, "Unfair, Unsustainable and Under the Radar: How Corporations Use Global Investment Rules to Undermine a Sustainable Future" 2013</p> <p>UNCITRAL Rules on Transparency in Treaty-Based Investor-State Arbitration, Resolution 68/109, Adopted by the General Assembly on December 16, 2013</p> <p>UNCITRAL Convention on Transparency in Treaty-Based Investor-State Arbitration, Resolution 69/116, Adopted by the General Assembly on December 10, 2014</p> <p>Publish What You Pay, Open Letter to President Obama</p> <p>Jennifer Kho, "Banking on Human Rights Protection for Major Infrastructure Projects", <i>The Guardian</i>, August 16, 2013</p> <p>Erry Riyana Hardjapamekas, "Southeast Asia warming up to EITI", <i>Extractive Industries Transparency Initiative</i>, September 21, 2012</p> <p>Eddie Rich, "The Relationship between EITI and Tax Justice" <i>Extractive Industries Transparency Initiative</i>, June 11, 2013</p> <p>Ian Gary "The Transparent Hypocrisy of Big Oil", <i>Oxfam America The Poverty of Politics Blog</i>, February 9, 2012</p> <p>Alice Ross, "Dodd Frank's bid to clean up extractive industries stymied by oil business" <i>The Guardian</i>, 22 July 2015</p> <p>Alex Blair, "Transparency is advancing in the UK, while US needs to catch up, <i>Oxfam America The Poverty of Politics Blog</i>, December 1, 2014</p>
--	---

		<p>The Thun Group of Banks, "UN Guiding Principles on Business and Human Rights – Discussion Paper for Banks on Implications of Principles 16-21", and accompanying Statement, October 2013</p> <p>BankTrack, "On the Thun Group Paper on Banks and Human Rights", December 2013</p> <p>Human Rights Watch, "World Bank: Ducking Human Rights Issues" July 22, 2013</p> <p>Human Rights Watch, "Abuse Free Development: How the World Bank Should Safeguard Against Human Rights Violations" 2013</p>
14.	<p>Conducting Business in Conflict Zones</p> <p>Corporate Accountability in Conflict Zones</p> <p>Paramilitary and Security Companies</p>	<p>The Voluntary Principles, 2000</p> <p>The Montreux Document, 2008</p> <p>Global Witness, "Simply Criminal: Targeting Rogue Business in Violent Conflict" November 2010</p> <p>International Code of Conduct for Private Security Service Providers, November 9, 2010</p> <p>Draft International Code of Conduct Certification Procedure, June 2015</p> <p>Human Rights Council, Report of the Special Representative of the Secretary-General on the issue of Human Rights and Transnational Corporations and other Business Enterprises, "Business and Human Rights in Conflict-Affected Regions: Challenges and Options towards State Responses", A/HRC/17/32, May 27, 2011</p> <p>Voluntary Principles on Security and Human Rights</p> <p>The Kimberley Process www.kimberleyprocess.com</p> <p>Raymond Saner, The Centre on Conflict Development and Peacebuilding, "Private Military and Security Companies: Industry led Self-Regulatory Initiatives versus State-led Containment Strategies", June 2015</p> <p>Salil Tripathi, "Business in Armed Conflict Zones" How to Avoid Complicity and Comply with International Standards" <i>Politorbis</i> (Published by the Swiss Federal Department of Foreign Affairs) Issue 50, March 2010</p> <p>Juliette Bennett. "Business in Zones of Conflict – The Role of Multinationals in Promoting Regional Stability" International Peace Forum, UN Global Compact Policy Dialogues/ January 2001</p> <p>Jessica Banfield, Virginia Haufler, Damian Lilly "Transnational Corporations in Conflict Prone Zones: A</p>

	<p>Public Policy Response and a Framework for Action”, International Alert, September 2003 (Chapters 2, 6 and 7)</p> <p>A Joint UN Global Compact and PRI publication, 2010 - “Guidance on Responsible Business in Conflict-Affected and High Risk Areas: A Resource of Companies and Investors.”</p> <p>International Alert, Red Flags: Liability Risks for Companies Operating in High Risk Zones</p> <p>Institute of Human Rights and Business, “From Red to Green Flags”, May 2011 (Read the Executive Summary of the Report)</p> <p>Salil Trapathi, “Have the Voluntary Principles realised their full potential?” Institute for Human Rights and Business, March 17, 2010</p> <p>Tyler Giannini & Susan Farbstein, Corporate Accountability in Conflict Zones: How <i>Kiobel</i> Undermines the Nuremberg Legacy and Modern Human Rights, 52 Harv. Int'l L.J. Online 119 (2010)</p> <p>Global Witness, “Global Witness leaves Kimberley Process, Calls for Diamond Trade to be held Accountable”, December 5, 2011</p> <p>Op-ed: Christine Bader, Security for Oil & Gas Projects can't Ignore Human Rights”, <i>Al Jazeera</i>, January 25, 2013</p> <p>Oxfam, “Oxfam leaves Voluntary Principles for Security and Human Rights multi-stakeholder initiative”, April 17, 2013</p> <p>War on Want, “Charity Slams Conduct Code for Private Military and Security Companies”, Press Release September 19, 2013</p> <p>Abdirashid Duale, “Operating in Conflict Zones: Lessons from a Financial Institution in Somalia”, <i>Guardian Sustainable Business</i>, July 28, 2014</p> <p>Oliver Balch, “Businesses have a role promoting peace in conflict zones” <i>Guardian Sustainable Business</i>, 22 September 2014</p> <p>Amnesty International, “European Companies allowed to reap rewards from deadly conflict mineral trade” September 24, 2014</p> <p>Jamila Trindle, “Supply Chain Disclosure Laws Sputter”, <i>ForeignPolicy.com</i>, September 25, 2014</p>
--	---

		Cass Sunstein, "How to Fight Blood Diamonds: Mandatory Disclosure" <i>Bloomberg View (USA)</i> , 26 October 2015
15.	Global Challenges in Technology, Freedom of Expression and Privacy	<p>Barrett, Wadhwa, Bauman-Pauly, Combatting Russian Disinformation: The Case for Stepping Up the Fight Online, NYU Stern Center for Business and Human Rights..., July 2018, (read Executive Summary and Recommendations): https://bit.ly/2mzbYCh</p> <p>Posner, Michael (2018): Forbes, "Why Algorithms Alone Can't Make The Internet Safe": https://bit.ly/2RWJsIn</p> <p>Mounk, Yascha (2018): New Republic, "Verboten: Germany's risky law for stopping hate speech on Facebook and Twitter": https://bit.ly/2GuxDs2</p> <p>Posner, Michael (2018): Forbes: "Confronting Facebook's Growing Pains": https://bit.ly/2tkUxsC</p> <p>Clinton, Hillary (2011), "Internet Rights and Wrongs: Choices & Challenges in a Networked World," George Washington University: https://bit.ly/2TGcehU</p> <p>Song, Billy (2018), The Washington Post "The West may be wrong about China's social credit system" https://wapo.st/2WZasKU</p> <p>Raphael, Rene and Xi, Ling (2019): The Nation: "Discipline and Punish: The Birth of China's Social- Credit System" https://bit.ly/2thT2vx</p>
16.	Human Rights and Supply Chain Management	<p>"Addressing Human Rights Issues in Global Supply Chains", http://library.ul.com/wp-content/uploads/sites/40/2015/02/UL_WP_Final_Addressing-Human-Rights-Issues-in-Global-Supply-Chains_v7-HR.pdf</p> <p>R.Mares, "The Limits of Supply Chain Responsibility: A Critical Analysis of Corporate Responsibility Instruments", (2010)</p> <p>UN Forum on Business and Human Rights, Session 17, December 2013 https://www.youtube.com/watch?v=_qPJbuxnjE4</p> <p>Shift, "Respecting Human Rights Through Global Supply Chains", 2012, http://shiftproject.org/sites/default/files/%20Respecting%20Human%20Rights%20Through%20Global%20Supply%20Chains%20Report.pdf</p> <p>Locke, Richard (2016): "We Live in a World of Global Supply Chains" Business and Human Rights: From</p>

	<p>Principles to Practice, Routledge, April 2016: Locke [LT FINAL].docx</p> <p>Barrett, Paul. Baumann-Pauly, Dorothee. Gu, April (2018). <i>Five Years After Rana Plaza: The Way Forward</i>, NYU Stern Center for Business and Human Rights: https://bit.ly/2JCskVe</p> <p>Bain, Marc (2018): "The international project to fix Bangladesh's garment industry may end in a whimper" https://bit.ly/2QyUO8L</p> <p>ITUC, Annual Survey of Violations of Trade Union Rights, 2014. http://survey.ituc-csi.org/ (Select one or two countries and review the information on context, legal environment, and actual practice in those countries)</p> <p>Nicholas Kristof and Sheryl WuDunn, "Two Cheers for Sweatshops," <i>The New York Times Magazine</i>. September 24, 2000. http://www.nytimes.com/library/magazine/home/20000924mag-sweatshops.html</p> <p>Christian Barry and Sanjay Reddy, "The False Dilemma of the Sweatshop," <i>Financial Times</i>, July 24, 2006, http://www.policyinnovations.org/ideas/policy_library/data/01334</p> <p>Shift, "Respecting Human Rights Through Global Supply Chains – Shift Workshop Report #2", October 2012: http://shiftproject.org/sites/default/files/%20Respectin g%20Human%20Rights%20Through%20Global%20Suppl y%20Chains%20Report.pdf</p> <p>Sarah Labowitz and Dorothée Baumann-Pauly, "Business as Usual is Not an Option – Supply Chains and Sourcing after Rana Plaza, April 2014: http://www.stern.nyu.edu/sites/default/files/assets/documents/con_047408.pdf</p>
17.	Revision
18.	FINAL EXAMS

Note: The Course Outlines are designed specifically to incorporate the relationship of business with human rights. The course outlines do not contain complete similarity with any other course offered at LLM/PHD level at Bahria University. The students will already have prior knowledge of International Law, Human Rights and Corporate Law when they opt for this course.

Books:

- D. Baumann-Pauly and Justine Nolan (eds.), Business and Human Rights from Principles to Practise (2016)
J. Ruggie, Just Business: Multinational Corporations and Human Rights (2013)
M. Mohan and C. Morel (eds.), Business and Human Rights in Southeast Asia (2015)

Helpful Links:

- Business & Human Rights in Law (www.bhrinlaw.org)
Business & Human Rights Resource Centre (www.business-humanrights.org)
Cambridge Business and Human Rights Journal (www.cambridge.org/core/journals/businessand-human-rights-journal)
Corporate Social Responsibility and the Law Blog (Foley Hoag LLP) (www.csrandthelaw.com)
Global Business Initiative on Human Rights (www.global-business-initiative.org/)
Human Rights and Business Country Guide (Danish Institute) (hrbcountryguide.org)
Human Rights and Business Dilemmas Forum (<https://hrbdf.org/>)
Institute for Human Rights and Business (www.ihrb.org)
UN Global Compact (www.unglobalcompact.org)
UN Working Group on Business and Human Rights (Materials) (businesshumanrights.org/en/working-group/latest-news-on-unwg)

Important Note: This course outline is a working outline for our semester. It is your responsibility to read everything stated in this document and meet all the requirements in order to complete the course successfully. If you do not read the whole course outline and meet the requirement entailed therein, you will take the responsibility for any penalty, e. g., fail grade misunderstanding, misinformation, or anything that may impact your grade.

CURRICULUM AND TOS OF FAMILY MEDICINE

INTRODUCTION

Family medicine is defined as that specialty of medicine which is concerned with providing comprehensive care to individuals and families and integrating biomedical, behavioural and social sciences. As an academic discipline, it includes comprehensive health care services, education and research. A family doctor is a physician who is a specialist trained to provide health care services for all individuals, regardless of age, sex or type of health problem. A family doctor provides primary and continuing care for entire families within their communities; addresses physical, psychological and social problems; and coordinates comprehensive health care services with other specialists as needed. Family doctors may also be known as family physicians or general practitioners, depending on the location of practice.

CURRICULUM FOR FAMILY MEDICINE

Objectives of Core Curriculum for Undergraduates

A basic medical graduate should be able to:

- a. Provide primary care, which is personalized, comprehensive and continuing
- b. Provide holistic care to the individual, family and community
- c. Establish a good doctor-patient relationship, show empathy, communicate effectively, educate, advise and counsel appropriately
- d. Recognize psychological, social and cultural influences on health and health-seeking behaviour
- e. Diagnose and manage common symptoms and common medical, surgical and psychosocial problems in patients of all ages and both sexes, with special emphasis on the child, the adolescent, the woman and the elderly;
- f. Provide initial emergency care including first aid measures, CPR and refer when necessary, using appropriate means of transportation
- g. Request appropriate investigations and practise cost-effective management with rational drug prescription
- h. Promote health and prevent diseases at every opportunity and support / cooperate with the implementation of national health programmes

Content areas

- a. Principles, concepts and scope of family medicine
- b. The consultation skills and doctor-patient relationship
- c. Personal care, primary care, continuing care, and comprehensive care
- d. Introduction to geriatrics, and care of the elderly
- e. Communication skills, counselling skills, breaking bad news, palliative care, bereavement
- f. Basic laboratory investigations, techniques, interpretation
- g. Essential drug list, rational prescribing and prescription writing
- h. Referral
- i. Health education of individual and family
- j. Management of:
 - common symptoms/illnesses in family practice
 - Psychosocial problems
 - Chronic diseases

- Common emergencies
- Dental problems

Structure of teaching in family medicine:

- Year 1 - 15 contact hours
- Year 2 - 20 contact hours
- Year 3 - 30 contact hours
- Year 4 - 35 contact hours

Sequence of teaching and teaching methods

Learning experiences should be spread through the entire period in medical school, from first to final year comprising of 100 contact hours

An appropriate combination of the following teaching-learning methods is recommended for undergraduate training programmes.

- (1) Classroom teaching with lectures, small group discussions, journal review as well as presentations on common case scenarios in all 4 years.
- (2) Clinical training through rotations to academic family medicine centres and GP clinics in the community in year 3 & year 4 (15 days each)
- (3) Other activities such as maintaining log books and patient diaries during clinical rotations.

Training site

The recommended training site is the 'family practice centre' run by the family medicine department. If the medical college does not have the functioning family practice centre, the primary or community health centre or First referral unit attached to the medical college can be used.

Assessment

Formative assessments, particularly in relation to communication skills and procedural skills, may be conducted during clinical rotations. Summative assessments may take the form of a separate examination in family medicine or form part of the examinations in clinical subjects (medicine, surgery, obstetrics & gynaecology, paediatrics, psychiatry) and in community medicine, with allocation of a specified percentage of these marks for family medicine.

The examination format may include theory questions (multiple choice questions, modified essay questions and / or structured essay questions), an oral examination, and clinical examination, including an Objective Structured Clinical or Practical Examination (OSCE or OSPE).

Road blocks for implementation

The current UG curriculum is fully packed with many specialties and it is a challenge to introduce a new specialty. It may not be possible to introduce it all years at one time, but it is feasible to introduce in the step-wise manner.

DISTRIBUTION OF CREDIT HOURS OF FAMILY MEDICINE CURRICULUM FOR UNDERGRADUATE STUDENTS OF BUMDC IN EACH YEAR

1ST YEAR MBBS

- Introduction to family medicine (1 contact hour)
- Types of consultation models (3 contact hours)
- Communication skills (5 contact hours)
- Vitals taking in skills lab (3 contact hours)
- General physical examination in skills lab (3 contact hours)

2ND YEAR MBBS

Patient interaction in OPDS

- Consultation Model Implementation (2 contact hours)
- Communication skills (2 contact hours)
- Vitals taking (2 contact hours)
- General Physical Examination (2 contact hours)

As Lectures/PBL

- Introduction to history taking (2 contact hour)
- Orientation of common symptoms in Medicine (2 contact hours)
- Orientation of common symptoms in Surgery (2 contact hours)
- Orientation of common symptoms in paediatrics (2 contact hours)
- Orientation of common symptoms in ObGyn (2 contact hours)
- Orientation of Common symptoms in EYE/ENT (2 contact hours)

3RD YEAR MBBS

This year FM curriculum will focus on Medicine, Surgery, Paediatrics & Obs/Gyn as follows:

<u>Medicine(10 contact hours)</u>	<u>Surgery (5 contact hours)</u>	<u>Paediatrics (5 contact hours)</u>	<u>Obs/Gyn (5 contact hours)</u>
Cough & Dyspnea	Acute Abdomen	Normal Growth & Development	Obs/Gyn history taking
Anemia	Trauma	Immunization/EPI	Antenatal Care
Fever	Wound Management/Burns	Breast Feeding/Weaning	Postnatal Care
Diarrhea & Constipation	Lump/Swelling	Malnutrition	
Haematemesis & Melena	Upper & Lower GI Bleed		
Headache	Approach to common oral problems		
Jaundice	Approach to common gingival problems		

Common procedures taught in 3rd year (in OPD/skills lab) = 5 contact hours

- Physical Examination including examination of Obstetric, Gynecological, Medical, Surgical & Dental conditions for adults, elderly and children
- Intra muscular and intravenous injections
- Explaining the use of inhaler and nebulizer device
- Wound dressing
- New born care

4th YEAR MBBS

This year FM curriculum will focus on Medicine, Paediatrics, ObGyn & Eye/ENT as follows:

<u>Medicine (10 contact hours)</u>	<u>Paediatrics (5 contact hours)</u>	<u>ObGyn (5 contact hours)</u>	<u>EYE/ENT (10 contact hours)</u>
Chest Pain	Micro & Macronutrient deficiencies	Menstrual Disorders	Red eye/eye discharge
Post MI/CVA rehabilitation	Common communicable diseases of children	Vaginal Discharge/STDs	Vision Loss
Hypertension	Common dermatological conditions of children	Contraception	Managing Eye emergencies in opd
Diabetes	Neonatal Jaundice	Subfertility/PCOs	Foreign body handling in OPD
Loss of consciousness	Thalassemia Counselling	Menopause	Prescription of common ophthalmologic medicines
Weight Gain			Nasal obstruction/Nasal Discharge
Weight Loss			Earache/Ear discharge
Depression/Anxiety Disorders			Hearing Loss
Skin Disorders			Voice change
Seizures/Fits			Neck swelling

Common procedures taught in 4th year (in OPD/skills lab)=5 contact hours

- Physical Examination including examination of ENT, Eye, Obstetric, Gynecological and Medical conditions for adults, elderly and children
- Interpretation of X-ray & ECG
- Packing of the nose in epistaxis
- Antenatal & Postnatal Care
- Counselling/Consultation

LEARNING OBJECTIVE FOR FAMILY MEDICINE CURRICULUM FOR UNDERGRADUATE STUDENTS OF BUMDC AND TEACHING METHODS WITH ASSESSMENT

1st Year MBBS (Total 15 contact hours)

- Each module contains 4 to 5 contact hours including the lectures taken in class for the whole batch with the skill lab teaching for small or large group of students

Curriculum contents and learning objectives

1. *Introduction to Family Medicine (2 contact hours)*
 - a. Define what is family medicine and general practice
 - b. Describe the principles of family medicine as biopsychosocial model as (patient - centered communication psychosocial awareness, patient education)
 - c. Explain about comprehensive care
 - d. Describe the importance of continuity of care
 - e. Teach them for health management and disease promotion
2. *Types of consultation models (3 contact hours)*
 - a. Explain about clinical consultation with its introduction
 - b. Define clinical consultation with its various types as (Balint, Berne, Byrne and long etc)
3. *Communication Skills (5 contact hours)*
 - a. Make the students understand the process of communication and its effects on giving and receiving information
 - b. Explain various types of communication i.e. verbal, nonverbal and visual
 - c. Describe how good communication can affect doctor-patient relationship
4. *Vital taking in Skill Labs (3 contact hours)*
 - a. Explain the importance of vital taking with the method and techniques for taking
 - i. Blood Pressure
 - ii. Pulse
 - iii. Respiratory rate
 - iv. Fever
 - v. Oxygen Saturation by using pulse oximeter
 - vi. BMI Calculation

Blood pressure

Demonstrate blood pressure monitoring in skills lab. Explain about patient position, different sizes of cuffs, site of cuff placement and explanation of importance of proper position of patient while taking B.P.

Pulse

Sites of checking pulse and explain the importance of recording pulse

Fever

Checking of fever by using thermometer, explain about different types of thermometer, sites with thermometer can be used, varying temperature different sites

Respiratory Rate

Checking of respiratory rate in adults and children with its importance medically

Oxygen Saturation

Use of pulse oximeter for oxygen saturation and explain its importance

BMI Calculation

Calculation of BMI and explanation of obesity

5. *General physical examination in Skills Lab (2 contact hours)*
 - a. State the purpose of general physical examination
 - b. Explain the safety precautions used during a general physical examination
 - c. Outline the steps necessary to prepare the patient for general physical examination
 - d. Perform the examination on a patient or simulator

Teaching Methods for 1st Year MBBS

Lecture room teaching for 1st Year MBBS students is required with four lectures (1 contact hour) in each module and use of skills lab for large or small group of students for teaching vital signs taking and general physical examination

Assessment for 1st Year MBBS

For 1st Year MBBS, 15 MCQ based exam will be conducted at the end of each module with a small 5 stations OSCE exam focusing on communication skills, vitals and examination

2nd Year MBBS (Total 15 contact hours)

- In 2nd year MBBS interaction of students with patients in OPD's is required for:
 - Consultation Model Implementation (2 contact hours)
 - Communication skills (2 contact hours)
 - Vital taking (2 contact hours)
 - General physical examination (2 contact hours)
- In 2nd year MBBS four lectures and few PBL sessions will be conducted in each module focusing on:
 - Introduction to history taking (2 contact hours)
 - Describe importance of history taking
 - Explain the process of history taking
 - Benefits of proper history taking
 - Orientation of common symptoms in Medicine (2 contact hours)
 - Describe common symptoms in Medicine
 - Examples of common conditions in Medicine
 - Brief introduction of common symptoms & conditions of various systems like respiratory, cardiovascular etc.
 - Orientation of common symptoms in Surgery (2 contact hours)
 - Describe common symptoms in surgery
 - Examples of common conditions in surgery
 - Brief introduction of common symptoms & conditions of various systems
 - Orientation of common symptoms in Pediatrics (2 contact hours)
 - Describe common symptoms in Pediatrics
 - Examples of common conditions in Pediatrics
 - Brief introduction of common symptoms & conditions of various systems
 - Orientation of common symptoms in ObGyn (2 contact hours)
 - Describe common symptoms in ObGyn

- Examples of common conditions in ObGyn
- Brief introduction of common conditions seen in pregnant women
- Orientation of common symptoms in ENT/EYE (2 contact hours)
 - Describe common symptoms in ENT/EYE
 - Examples of common conditions in ENT/EYE
 - Brief introduction of common symptoms & conditions of ENT/EYE

Teaching Methods for 2nd Year MBBS

Lecture room teaching for 2nd Year MBBS students is required with four lectures (1 contact hour) in each module and PBL session for large or small group of students for teaching general symptoms in Medicine, Surgery, ObGyn, Pediatrics and ENT/EYE. Clinical sessions at OPD is also required

Assessment for 2nd Year MBBS

For 2nd Year MBBS, 15 MCQ based exam will be conducted at the end of each module with a small 5 stations OSCE exam focusing on communication skills, vitals, examination and common symptoms of Medicine, Surgery, ObGyn, Pediatrics and ENT/EYE.

LEARNING OBJECTIVE FOR FAMILY MEDICINE CURRICULUM FOR UNDERGRADUATE STUDENTS OF BUMDC AND TEACHING METHODS WITH ASSESSMENT

3rd Year MBBS (30 credit hours)

Total 10 contact hours from each module will be dedicated to Family Medicine teaching including 25 class-room teaching contact hours and 05 contact hours for OPD/skill lab teaching as per availability.

MEDICINE (10 credit hours)

Cough & Dysnea:

To discuss the approach towards a patient with cough and dysnea by taking relevant history and doing relevant examination, making differential diagnosis, ordering relevant investigations, general management and red flags.

Anemia

To take relevant history and do relevant examination of anemia, discuss its differential diagnoses, order relevant investigations, plan general management and red flags with points of referral.

Fever

To take relevant history and do relevant examination of fever, discuss the differential diagnoses of fever with and without focus, order relevant investigations, plan general management and red flags with points of referral.

Diarrhea & Constipation

To take relevant history and do relevant examination for diarrhea & constipation, discuss their differential diagnoses, order relevant investigations, plan general management and red flags with points of referral

Haemetemesis & Melena

- ✓ To assess the stability of patients with haemetemesis and make arrangement for the referral to tertiary care facility with explanation of the possible diagnoses to patients and attendants.
- ✓ To take relevant history and do relevant examination for melena, discuss its differential diagnoses, order relevant investigations and refer.

Headache

To take relevant history and do relevant examination, discuss the differential diagnoses of headache, order relevant investigations, plan general management and red flags with points of referral.

Jaundice

To take relevant history and do relevant examination, discuss the differential diagnoses of jaundice, order relevant investigations, plan general management and red flags with points of referral.

SURGERY (05 credit hours)

Acute Abdomen

To take pertinent history and do relevant examination keeping in mind the differentials of acute abdomen, give initial first aid treatment, explain the red flags and make arrangements for transfer to tertiary care facility for further management.

Trauma

To do the examination and able to perform the initial management of trauma and refer for further management.

Wound Management/Burns

To do the examination and able to perform the initial management of wounds with dressing & tetanus immunizations and refer for further management if needed.

Lump/Swelling

To discuss the approach towards patients with different lumps/swelling by taking relevant history and do pertinent examination; order initial investigations and refer to specific facility for further diagnosis and management.

Upper & Lower GI Bleed

To take pertinent history and do relevant examination keeping in mind the differentials, give initial first aid treatment, explain the red flags and make arrangements for transfer to tertiary care facility for further management depending upon the patient stability.

Dental Problems

To take relevant history of common oral and gingival problems and be able to do focussed examination and make differentials, identify the red flags and refer when needed.

PAEDIATRICS (05 CREDIT HOURS)

Normal growth & Development

To discuss the relevant history and examination for assessment of the normal growth and development patterns of children, approach towards any abnormal development patterns and red flags with referral.

Immunization/EPI

To discuss the immunization process of EPI/WHO/CDC and routine and catch-up immunization of children with their indications, contraindications and side-effects.

Breast-feeding/Weaning

To understand the importance of breast feeding with discussion of common lactation problems, their management and weaning strategies.

Malnutrition

To discuss the relevant history and examination for assessment of the signs of malnourished children, order relevant investigations, understand the general management strategies and red flags for referral as needed.

OBS/GYN(05 CREDIT HOURS)

Obs/Gyn History taking

To discuss in detail the different points of history taking in gynaecology and obstetrics with focus on the strategy to ask relevant questions and interpretation of data to make diagnosis and referral.

Antenatal Care

To take relevant antenatal history, do pertinent examination and manage common antenatal complains keeping in mind red flags and points of referral.

Postnatal Care

To take relevant postnatal history, do pertinent examination and manage common postnatal complains keeping in mind red flags and points of referral.

Methods of Assessment

Annual assessment will be done by an MCQ based paper comprising of 30 MCQs from the topics being taught in 3rd year family medicine curriculum.

An OSCE consisting of 5 stations will be conducted at year end along with other major subjects.

LEARNING OBJECTIVES OF FAMILY MEDICINE CURRICULUM FOR UNDERGRADUATE STUDENTS OF BUMDC

4TH YEAR MBBS (35 CREDIT HOURS)

Total 10 contact hours from each module will be dedicated to Family Medicine teaching including 25 class-room teaching contact hours and 05 contact hours for OPD/skill lab teaching as per availability.

CURRICULUM CONTENTS AND LEARNING OBJECTIVES

MEDICINE (10 credit hours)

By the end of the family medicine rotation the 4th year medical student should be able to:

Chest pain

- Conduct a focused cardiac history (including cardiac risk factors) and a relevant physical exam in a patient presenting with chest pain.
- Develop a concise differential diagnosis for patients with chest pain including cardiac and non-cardiac causes.
- Describe the key clinical characteristics of the following chest pain etiologies: angina (stable and unstable), embolism, gastro esophageal reflux, costochondritis, anxiety, pneumonia.
- Describe the family physicians' role in the stabilization and initial management of patients identified to require emergent cardiac care.

Post MI/CVA rehabilitation

- Describe an early post-ischemic event management plan including lifestyle changes, medications, psychosocial support, cardiac rehabilitation, etc.
- Propose a surveillance and management plan for secondary prevention of cardiovascular events in patients with IHD and CVA

Hypertension

- Define how to diagnose hypertension in a family practice setting for different patient groups, and identify the blood pressure targets for these groups.
- Describe end-organ damage from hypertension and how to assess a patient for these.
- Propose an initial diagnostic workup for a patient with a new diagnosis of high blood pressure to determine if there is a secondary cause for hypertension (versus essential hypertension.)
- Define the diagnostic and treatment targets for various groups of patients with high blood pressure.
- Propose a treatment plan (incorporating non-pharmacologic and pharmacologic options) for a patient with a new diagnosis of high blood pressure.
- Recognize and act on a hypertensive crisis.
- Discuss the various drug classes used to treat high blood pressure.

Type 2 Diabetes Mellitus:

- Identify patients at risk for T2DM and select an appropriate screening strategy.
- Diagnose T2DM using current criteria.

- Discuss with patients the importance of lifestyle in the management of diabetes and the prevention of complications, especially the role of exercise, nutrition and avoidance of tobacco.
- Propose an initial therapeutic plan for patients with T2DM

Loss of consciousness

- Describe the common and important medical conditions that cause loss of consciousness/ syncope and their characteristic features on history and exam.
- Discuss the evaluation and management of patients presenting with syncope.

Weight gain

- Take focused problem oriented medical history and conduct physical examination of a patient presenting with weight gain
- Define the causes of obesity and recognize its long-term complications
- Discuss the interventional strategies that are involved in weight reduction
- Calculate and interpret body mass index
- Promote a healthy lifestyle and obesity prevention

Weight loss

- Discuss the family physician's approach towards a patient presenting with weight loss
- Identify appropriate diagnostic tests and develop a differential diagnosis for weight loss
- Discuss the red flags, management options and points of referral for patients presenting with weight loss.

Depression/anxiety disorders

- Elicit the common symptoms associated with depression and anxiety using current criteria and other diagnostic and functional assessment tools.
- Identify high risk groups for depression and anxiety disorders
- Perform a mental status examination, including assessment of suicide/homicidal risk and take appropriate action where necessary.
- Propose non-pharmacologic and pharmacologic management options for patients with depression and/or anxiety, including risks, benefits and limitations of the method(s) used.

Skin disorders

- Describe skin lesion(s) using appropriate terminology
- Recognize and propose initial management for common dermatological conditions: skin infections, Psoriasis, Acne, Drug-induced reactions, Drug eruptions, Anaphylaxis/hives
- List the indications for biopsy and/or referral

Seizures/fits

- Take focused problem oriented medical history and conduct physical examination of a patient presenting with seizure along with the treatment and points of referral
- Identify appropriate diagnostic tests and develop a differential diagnosis for patients presenting with seizures.

PEDIATRICS (05 CREDIT HOURS)

By the end of the family medicine rotation the 4th year medical student should be able to:

Micro & macronutrient deficiencies

- Discuss the relevant history and examination for assessment of Micro & macronutrient deficiencies in children.
- Describe the various types of nutritional deficiencies along with their clinical presentations.
- Discuss the evaluation and treatment of rickets.

Neonatal jaundice:

- Discuss the evaluation and treatment of neonatal jaundice.
- Discuss the points of referral for neonatal jaundice

Common communicable diseases of children

- Describe common communicable/infectious diseases in children with their treatment (e.g. URTI, LRTI, AGE).

Common dermatological diseases of children

- Describe common dermatological diseases in children with their treatment (e.g. Viral exanthemas, herpes, shingles, molluscum contagiosum, warts, impetigo, cellulitis, tinea, candida, worm infestations).

Thalassemia counselling

- Demonstrate effective counselling skills regarding thalassemia

OBS/GYN (05 CREDIT HOURS)

By the end of the family medicine rotation the 4th year medical student should be able to:

Menstrual disorders

- Conduct a patient-centred interview and appropriate focused physical examination to identify menstrual disorders and their causes. (Amenorrhea, menorrhagia, dysmenorrhea, dysfunctional uterine bleeding)
- Suggest appropriate investigations and rule out pelvic infections, pregnancy, tumours, GU or GI causes in a timely fashion.

- Develop an evidence-based treatment plan for menstrual irregularities which includes lifestyle counselling, non-pharmacological and pharmacological modalities.

Contraception

- Counsel patients on different contraceptive methods available.

Vaginal discharge/STIs

- Perform a complete clinical patient assessment including history and exam in patient presenting with vaginal discharge,
- Discuss the family physician's approach to sexually transmitted illnesses.
- Counsel patients on STI prevention and screen when appropriate.

Subfertility/PCOS

- Describe the role of family physicians in caring for patients with subfertility,
- Conduct a patient-centred interview and focused physical exam to assess for signs and symptoms of PCOS.
- Develop a management plan for a patient with PCOS.

Menopause

- Conduct a patient-centred interview and focused physical exam in a woman presenting with menopause
- Counsel menopausal women about preventative health measures (osteoporosis, mammography, etc)

EYE & ENT (10 CREDIT HOURS):

By the end of the family medicine rotation the 4th year medical student should be able to:

Problems of Eye

- Conduct a complete clinical assessment including history and examination on a patient presenting with common problems of the eye. (e.g. red eye, discharge from eye, loss of vision, etc.)
- Recognize, evaluate and manage acute and chronic ophthalmology conditions & emergencies (e.g. Conjunctivitis, eye injuries, cataract, Glaucoma, Blepharitis, Sty)
- Discuss the management and points of referral for patients.

Problems of ENT/head & neck:

- Conduct a complete clinical assessment including history and a proper examination and interpret its findings on a patient presenting with voice change/hoarseness, nasal obstruction/nasal discharge, hearing loss, earache/ear discharge, swelling of neck, neck mass.
- Recognize, evaluate and manage acute ENT conditions and emergencies (e.g. Acute pharyngitis – epistaxis - allergic rhino- sinusitis - acute upper respiratory tract infection – otitis, etc.)
- Discuss the management and points of referral for patients presenting with head and neck problems.

Procedural skills (5 credit hours):

By the end of the family medicine rotation the 4th year medical student should be able to:

- Conduct all systemic examinations including ENT, Eye, Obstetric/gynecological (Antenatal & Postnatal), pediatric examination.
- Interpret X-rays & ECG
- Conduct Packing of the nose in epistaxis
- Demonstrate effective Counselling/Consultation skills

Teaching methods

- Classroom teaching with lectures, small group discussions, journal review and seminars as well as presentations on common case scenarios;
- Clinical training through rotations to academic family medicine clinics in the community.
- Other activities such as maintaining log books, case study write- ups, seminars and workshops, etc.

Assessment

Annual assessment will be done by an MCQ based paper comprising of 30 MCQs from the topics being taught in 4th year family medicine curriculum.

An OSCE and Viva voce (on a log diary, portfolio) consisting of 10 stations will be conducted at year end along with other major subjects.

BAHRIA UNIVERSITY ISLAMABAD TABLE OF SPECIFICATIONS (THEORY)
SUBJECT: Family Medicine FIRST PROFESSIONAL MBBS
No of MCQs: 15, No of SEQs: 02, Total MCQs Marks: 15 Total SEQs Marks: 10,
Internal Assessments: 5

First Year MBBS

- 16.1 Introduction to Family Medicine (MCQ = 15) (SEQ = 2)**
- 16.1.1 Types of consultation models
 - 16.1.2 Communication Skills
 - 16.1.3 Introduction to Vital Signs
 - 16.1.4 Introduction of General physical examination and its importance

BAHRIA UNIVERSITY ISLAMABAD TABLE OF SPECIFICATIONS (THEORY)
SUBJECT: Family Medicine FIRST PROFESSIONAL MBBS
No of MCQs: 15, No of SEQs: 02, Total MCQs Marks: 15 Total SEQs Marks: 10,
Internal Assessments: 5

Second Year MBBS

- 16.2 Introduction to Family Medicine (MCQ = 15) (SEQ = 2)**
- 16.2.1 Consultation model implementation
 - 16.2.2 Communication Skills implementation
 - 16.2.3 Vital Signs taking
 - 16.2.4 General physical examination

BAHRIA UNIVERSITY ISLAMABAD TABLE OF SPECIFICATIONS (THEORY)
SUBJECT: Family Medicine Second PROFESSIONAL MBBS
Total Marks: 50 No of MCQs: 30, No of SEQs: 04, Total MCQs
Marks: 30 Total SEQs Marks: 10, Internal Assessments: 10

16.3 Medicine (MCQ:15; SEQ:1)

- 16.3.1 Cough & dyspnea
- 16.3.2 Anemia
- 16.3.3 Fever
- 16.3.4 Diarrhea & Constipation
- 16.3.5 Hematemesis & Melena
- 16.3.6 Headache
- 16.3.7 Jaundice

16.4 Surgery (MCQ:05; SEQ:01)

- 16.4.1 Acute Abdomen
- 16.4.2 Trauma
- 16.4.3 Wound Management/Burns
- 16.4.4 Lump/Swelling
- 16.4.5 Upper/Lower GI Bleed
- 16.4.6 Oral problems
- 16.4.7 Gingival problems

16.5 Paediatrics (MCQ:05; SEQ:01)

- 16.5.1 Normal growth & development
- 16.5.2 Immunization/EPI
- 16.5.3 Breastfeeding/Weaning
- 16.5.4 Malnutrition

16.6 Obs/Gyne (MCQ:05; SEQ:01)

- 16.6.1 Obs/Gyne History taking
- 16.6.2 Antenatal Care
- 16.6.3 Postnatal Care

BAHRIA UNIVERSITY TABLE OF SPECIFICATIONS (THEORY)

Subject: Family Medicine- 4th year MBBS

16.7 Medicine

- 16.7.1 Approach to chest pain
- 16.7.2 Hypertension and MI
- 16.7.3 Cardiac and stroke rehabilitation
- 16.7.4 Diabetes Type 2
- 16.7.5 Approach to Loss of consciousness
- 16.7.6 Approach to Weight loss
- 16.7.7 Approach to Weight gain
- 16.7.8 Approach to Seizures/fits
- 16.7.9 Approach to Depression/anxiety disorders
- 16.7.10 Approach to Common skin disorders

16.8 Paediatrics

- 16.8.1 Approach to Common communicable diseases in children
- 16.8.2 Approach to Common dermatological conditions in children
- 16.8.3 Approach to Neonatal jaundice
- 16.8.4 Approach to Thalassemia
- 16.8.5 Approach to Micro & macronutrient deficiencies in children

16.9 Obstetrics & Gynecology

- 16.9.1 Contraception
- 16.9.2 Antenatal care
- 16.9.3 Postnatal care
- 16.9.4 Approach to Irregular periods/Menstrual disorders
- 16.9.5 Approach to Menorrhagia
- 16.9.6 Approach to Amenorrhoea
- 16.9.7 Approach to Pelvic pain
- 16.9.8 Approach to Vaginal discharge
- 16.9.9 Sexually transmitted infection
- 16.9.10 Polycystic ovarian syndrome
- 16.9.11 Postmenopausal bleeding
- 16.9.12 Menopause
- 16.9.13 Approach to Infertility - evaluation and management

16.10 Otolaryngology

- 16.10.1 Approach to Deafness/Hearing loss
- 16.10.2 Approach to Earache and discharge
- 16.10.3 Approach to Hoarseness/voice change
- 16.10.4 Approach to Epistaxis
- 16.10.5 Approach to Nasal obstruction & nasal discharge
- 16.10.6 Approach to swelling of the neck

16.11 Ophthalmology

- 16.11.1 Approach to the discharging eye
- 16.11.2 Approach to red eye
- 16.11.3 Approach to visual loss
- 16.11.4 Foreign body in eye
- 16.11.5 Prescription of common ophthalmologic medicines
- 16.11.6 Managing eye emergencies

ESTABLISHMENT OF BAHRIA UNIVERSITY POST GRADUATE INSTITUTE OF HEALTH SCIENCES (BU-PGIHS). UPDATED VISION, MISSION STATEMENT, TERMS OF REFERENCES, OBJECTIVES, OUTCOME, ORGANOGRAM OF BU-PGIHS FOR DELIBERATION AND APPROVAL

VISION

“To become an internationally recognized university that contributes towards the development of nation through excellence in education and research”

MISSION STATEMENT

“To attain highest standards in health professional learning, teaching and transformative research at par with the international level through evidence based holistic approach for prevention, diagnosis and treatment of human illnesses by providing quality health services to the community”

OBJECTIVES OF BU-PGIHS

At the end of the postgraduate training in the discipline concerned the student shall be able to:

- a. Demonstrate qualities of an effective, responsible teacher and researcher in health professional sciences.
- b. Apply critical enquiry for promotion of evidence based theoretical knowledge to practice.
- c. Recognize the importance of the concerned specialty in the context of the health need of the community and as per the national health priorities.
- d. Practice the specialty concerned ethically and in accordance to the mission of BU-PGIHS.
- e. Demonstrate sufficient understanding of the health professional sciences relevant to the concerned specialty.
- f. Identify social, economic, environmental, biological and emotional determinants of health care for subsequent planning of therapeutic, rehabilitative, preventive and management measures.
- g. Diagnose, plan, treat, manage and advice for prevention and rehabilitation of common conditions in the specialty concerned.
- h. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
- i. Play the assigned role in the implementation of national health programs, effectively and responsibly.
- j. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the institution/ clinic/hospital / facility or the field situation.
- k. Develop skills as a self-directed lifelong learner.
- l. Recognize continuing educational needs, select and use appropriate learning resources.
- m. Develop skills in using educational methods and techniques as applicable to teaching, training and research of health professional students.
- n. Function as an effective leader of a team engaged in health care, teaching, training and research.

OUTCOMES OF BU-PGIHS SHALL BE TO

- a. Produce competent, skilled aspiring professionals and researchers in health professional fields (medicine, dentistry, nursing, public health, physical therapy and allied health sciences) committed to serve humanity by using a patient oriented and evidence based model of educational excellence.
- b. Prepare ethical, skilled, intellectual and disciplined professional leaders committed to the highest standards of health education in the country.
- c. Educate inspiring future leaders in health sciences to seek, provide and sustain achievements in teaching, training, research and service.
- d. Provide comprehensive, patient oriented, culturally sensitive, compassionate and innovative health care professionals to the community.
- e. Evolve professionals who will utilize innovative excellence to optimize patient safety, provision of services and use of available resources for better outcomes.
- f. Develop intellectuals for enhancing the understanding of human health and disease through research at grass root level, translating these discoveries into new solutions for improving the quality of life.
- g. Provide health professionals of next generation, a forum for communication, identification of existing lacunae and sharing of knowledge at national and international level.
- h. Prepare team members for strengthening the health care system of the country by contributing to policy making and enhancement of human resource development.
- i. Prepare workforce leaders of next generation in health profession at highest educational standards, equipped with ideas of innovative emerging trends and techniques relevant to health sciences.
- j. Produce reputed researchers for conducting and sustaining research of academic excellence for creation of new knowledge, provision of feasible solutions and for improvement of existing knowledge in the field of health sciences.
- k. Generate policy makers for contribution to economic development of Pakistan via integrated research programs through patient centered approaches directed towards policy making.

TERMS OF REFERENCE

BAHRIA UNIVERSITY POSTGRADUATE INSTITUTE OF HEALTH SCIENCES

- a. To align the vision of Bahria University for postgraduate health professional education in Pakistan, in support of the long-term healthcare needs of Pakistan.
- b. To advocate standards and educational outcomes for postgraduate health professional education in Pakistan, including core curriculum components that will highlight the design of postgraduate health education in Pakistan.
- c. To formulate key principles and features of teaching, training and research framework that would support the vision and educational outcomes of postgraduate health professional education in Pakistan.
- d. To provide strategies and steer the long-term development of postgraduate health professional education in our country.
- e. To equip the postgraduate health professional students with the ability to critically appraise the literature, understand basic principles of research and apply evidence-based reference tool in their projects.
- f. To keep postgraduate health professional students abreast of local technological advances in medical and health sciences related fields, such as integration of information technology to connect healthcare facilities and institutions nationwide.

- g. To equip every postgraduate health professional with all the required knowledge, technical skills, behavioral and communication skills (verbal, written and body language), empathy, compassion and professionalism in order to provide holistic, patient-centered applied approach in research projects.
- h. To enable postgraduate health professional students to bring forward cost-effective management solutions aligned with the economic and financial dimension in our country.
- i. To train postgraduate health professional students to produce cost effective projects by working under affordability and resource constraints, without compromising the needs of the patients.
- j. To expedite the academic growth and development in undergraduate health sciences education by providing properly qualified and trained health professionals in basic and clinical health sciences as teachers.
- k. To establish linkages with leading institutions nationally and internationally for collaboration and exposure of local research scholars.
- l. To energize the health care delivery system and replenish the academia in the health professional's educational set up. Well educated and trained health related professionals engaged as academician and researchers for the benefit of community.
- m. To improve health standards of the community in this underdeveloped region of the world by focusing research on regional health issues.
- n. To develop human resource, research and technology in our institute and country ultimately helping the national economy.
- o. To provide guidance / help in policy making on any other matter related to postgraduate teaching, training and research in health sciences.
- p. To inculcate critical thinking and self reflection to produce leaders of next generation in the fields of health professional sciences.

Terms of Reference for the Advisors to PGP-TM& BU-PGIHS

- 1. To provide a broader perspective on issues related to Pakistan's medico-social and health needs.
- 2. To review issues presented to them by the PGP-TM office during the tenure of the committee.
- 3. Each advisor is appointed for a term of two year.

BAHRIA UNIVERSITY FACULTY OF HEALTH SCIENCES**FUTURE GROWTH IN POSTGRADUATE PROGRAMS DEGREE PROGRAMS BASIC HEALTH SCIENCES**

(A) MPhil		
Sr #	Course/Program	Duration
MEDICAL		
1	M. Phil (Anatomy)	2 years
2.	M. Phil (Pathology) Histopathology Microbiology	Already running 2 years
3	M. Phil (Pharmacology)	2 years
*4	M. Phil (Physiology)	For launch in Phase-1 2 years
*5	M. Phil (Biochemistry)	of BU-PGIHS 2 years
6	M. Phil Pathology (Haematology)	2 years
7	M. Phil Pathology (Immunology)	2 years
8	M. Phil Pathology (Virology)	2 years
9	M. Phil (Chemical Pathology)	2 years
10	M. Phil (Genetics)	2 years
11	M. Phil (Community Medicine)	2 years
12	M. Phil (Forensic Medicine)	2 years
13	M. Phil (Morbid Anatomy & Histopathology)	2 years
14	Cellular and Molecular Biology	2 years
DENTAL		
15	M. Phil (Oral Pathology)	2 years
16	M. Phil (Science of Dental Materials)	2 years
17	M. Phil (Oral Biology)	2 years
18	M. Phil (Community Dentistry)	2 years
PHYSICAL THERAPY		
19	MPhil	2 years
MEDICAL LAB TECHNOLOGY		
20	MPhil Allied Health Sciences	2 years
NURSING		

21	MPhil	2 years
(B) PhD		
Sr #	Course/Program	Duration
MEDICAL		
1	PhD (Anatomy)	4 years
2	PhD(Pathology) Histopathology Microbiology	4 years
3	PhD (Pharmacology)	4 years
4	PhD (Physiology)	4 years
5	PhD (Biochemistry)	4 years
6	PhD (Public Health / Community Medicine)	4 years
7	PhD Pathology (Haematology)	4 years
8	PhD Pathology (Immunology)	4 years
9	PhD Pathology (Virology)	4 years
10	PhD (Chemical Pathology)	4 years
11	PhD (Genetics)	4 years
12	PhD (Community Medicine)	4 years
13	PhD (Forensic Medicine)	4 years
14	PhD (Morbid Anatomy & Histopathology)	4 years
15	PhD(Cellular and Molecular Biology)	4 years
DENTAL		
16	PhD (Oral Pathology)	4 years
17	PhD (Science of Dental Materials)	4 years
18	PhD (Oral Biology)	4 years
19	PhD(Community dentistry)	4 years
PHYSICAL THERAPY		
20	PhD	4 years
MEDICAL LAB TECHNOLOGY		
21	PhD	4 years
NURSING		
22	PhD	4 years

(C)Masters		
MEDICAL		
1	Masters in Public Health (MPH)	2 years
2	Masters in Family Medicine	2 years
3	Masters in Health Professional Education (MHPE)	2 years
DENTAL		
4	Masters in Dental Materials, community Dentistry, Oral biology	2 years
NURSING		
5	Masters in Nursing	2 years
PHYSICAL THERAPY		
6	Masters in Transitional Doctor of Physiotherapy (T-DPT)	2 years
MEDICAL LAB TECHNOLOGY		
7	Masters in Allied Health Sciences	2 years

POSTGRADUATE DEGREE PROGRAMS (CLINICAL MEDICAL SCIENCES)

MS		
Sr #	Course/Program	Duration
1	MS (General Surgery)	4 years
2	MS (Anesthesia)	5 years
3	MS (Ophthalmology)	5 years
4	MS (Neurosurgery)	5 years
5	MS (Orthopaedic Surgery)	5 years
6	MS (Obst. &Gynae.)	5 years
7	MS (ENT)	5 years
8	MS (Plastic Surgery)	5 years
9	MS (Paediatric Surgery)	5 years
10	MS (Cardiac Surgery)	5 years
11	MS (Thoracic Surgery)	5 years
12	MS (Urology)	5 years

MD		
Sr #	Course/Program	Duration
1	MD (Internal Medicine)	4 years
2	MD (Dermatology)	5 years
3	MD (Paediatrics)	5 years
4	MD (Nephrology)	5 years
5	MD (Cardiology)	5 years
6	MD (Radiology)	5 years
7	MD (Gastroenterology)	5 years
8	MD (Pulmonology including Tuberculosis)	5 years
9	MD (Psychiatry)	5 years
10	MD (Endocrinology)	5 years
11	MD (Neurology)	5 years
12	MD (Oncology)	5 years
13	MD (Radiotherapy)	5 years
14	MD (Developmental Pediatrics)	5 years

III. POSTGRADUATE DEGREE PROGRAMS (DENTAL SCIENCES)

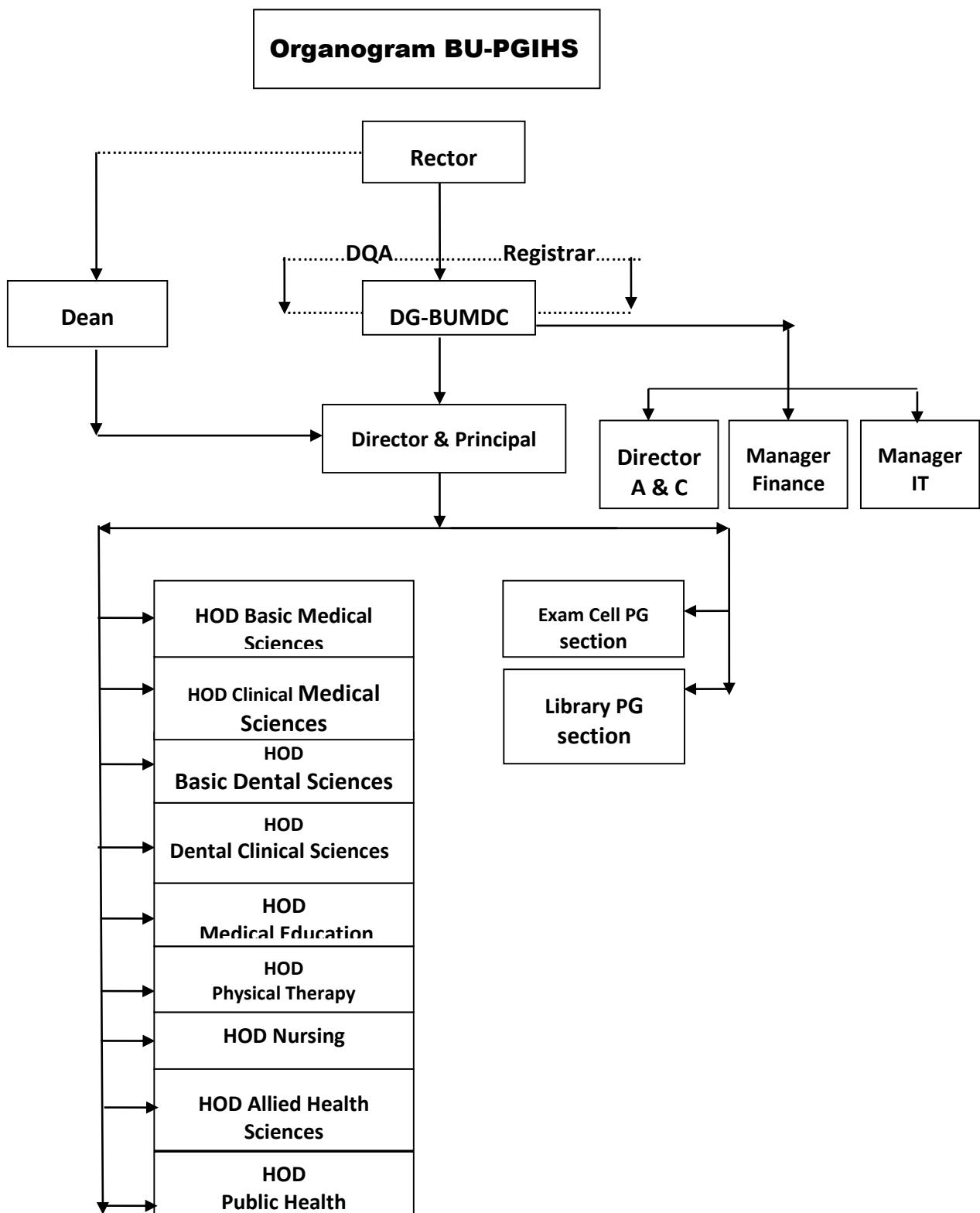
MDS		
Sr #	Course/Program	Duration
1	M.D.S. Operative Dentistry	4 years
2	M.D.S. Oral & Maxillofacial Surgery	4 years
3	M.D.S. Orthodontics	4 years
4	M.D.S. Periodontology	4 years
5	M.D.S. Prosthodontics	4 years

IV. POSTGRADUATE DIPLOMA PROGRAMS CLINICAL MEDICAL SCIENCES

Postgraduate Diplomas		
Sr #	Course/Program	Duration
1	Diploma in Medical Jurisprudence (DMJ)	2 years
2	Diploma in Tuberculosis and Chest Disease (DTCD)	2 years
3	Diploma in Psychological Medicine (DPM)	2 years
4	Diploma in Medical Radiology (Therapeutics) (DMRT)	2 years
5	Diploma in Ophthalmic Medicine & Surgery (DOMS)	2 years
6	Diploma in Laryngology and Otology (DLO)	2 years
7	Diploma in Cardiology (Dip-Card)	2 years
8	Diploma in Child Health (DCH)	2 years
9	Diploma in Clinical Pathology (DCP)	2 years
10	Diploma in Medical Radiology (Diagnostic) (DMRD)	2 years
11	Diploma in Gynecology and Obstetrics (DGO)	2 years
12	Diploma in Anesthesia (DA)	2 years
13	Diploma in Assisted Reproductive Techniques (DART)	2 years

IV. POSTGRADUATE DIPLOMA PROGRAMS DENTAL SCIENCES

14	Diploma in Clinical Dentistry (DCD) Orthodontics, Periodontics, Paedodontics Operative Dentistry	2 years
----	--	---------



NEW PROGRAMME PROPOSAL - MPHIL IN BIOCHEMISTRY

A. ACADEMIC DETAILS	
1	Faculty/Department: Faculty of Health Sciences – Medical College- Basic Health Sciences
2	Title of the Program: (to be printed on Degree/Transcript) MPhil in Biochemistry
3	Mission of the Program: To attain highest standards of learning, teaching and transformative research in the field of human Biochemistry in health professional education.
4	Objectives of the Program: At the end of program the MPhil graduate should be able to: <ol style="list-style-type: none"> Demonstrate professional attitudes and ethical values to fulfill social and professional responsibility to community. Apply critical inquiry for promotion of evidence based theoretical knowledge to practice. Analyze the research skills including analytical, synthesis, application, implementation, quality and implications. Work as a responsible, dedicated, effective teacher and keen researcher independently. Display interpersonal skills including communication with experts, self-critic, social skills, team work etc. Perform life-long learning skills by accepting one's limitations to knowledge and with an urge to continuously update the knowledge. Present research results in national / international scientific forums and publish in journals.
5	Outcomes of the Program: The program is committed to produce : <ol style="list-style-type: none"> Teachers and researchers equipped with professional attitudes and ethical values to fulfill social and professional responsibility to community. Professionals inculcated with application of critical inquiry for promotion of evidence based theoretical knowledge for practice. Graduates equipped with analytical, synthesis, application implementation, quality, implications etc. skills Responsible, effective teachers and researchers in basic health sciences with ability to work independently Interpersonal skills in professionals including communication with experts, self-critical, social skills, team work etc. Life-long learning skills in professionals by accepting one's limitations to knowledge and urge to continuously update the knowledge. Good presenters of research results in national / international scientific forums along with publications in journals.
6	Rationale for the Program: There is scarcity of professionals in basic health sciences in the subject of Biochemistry in our country. MPhil program in Biochemistry will prepare postgraduates for health education institutions particularly in areas of basic science teaching and research. This will promote faculty development in basic health sciences education and will provide opportunity for junior medical, dental, nursing, physical therapy and allied health sciences faculty in the city/

	province/ country including Bahria University Medical & Dental College (BUMDC)to enhance their professional career as a teacher and researcher in the field of basic health sciences.
7	Brief Description of the Program: The Master of Philosophy (MPhil) degree program of Biochemistry at Bahria University Medical & Dental College aims to prepare postgraduates in health professional educational institutions particularly in areas of basic science teaching &research. This will promote faculty development in basic sciences education, and provide opportunity for junior health sciences faculty including Bahria University Medical & Dental College (BUMDC)to enhance their professional career as a teacher and researcher in the field of basic health sciences.
8	Duration: 2 years
9	Venue(s): On Site/Off Site/Both On & Off Site (<i>Tick one; if Off Site, give details</i>) On site
10	Program Scheduling Format: Morning/Evening/Weekend (<i>tick one</i>) Morning Semester/Annual/ (<i>tick one</i>) Semester
11	Proposed Date of Commencement: Depends upon the NOC obtained from PMDC & HEC
12	Mode of Study/Examination: As per HEC semester based programs guidelines (Interactive lectures, cases, critical review, assignments, presentations, quizzes) (mid-term & final semester exam in each semester)
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) 01 visiting faculty - MPhil / PhD in genetics - part of Biochemistry
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: Addition of book titles & journals required as per HEC criteria.
18	Minimum Qualification for Admission: MBBS / BDS Eligibility criteria page # 14 MS/ MPhil Rules 2017
19	Admission Eligibility Criteria: (to be aligned with accreditation/regulatory bodies) Aligned with PMDC & HEC
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>) Nil

21	Number of Admissions Expected for First Intake: 04 (keeping in view admission in existing MPhil Programs)
22	Number of Admissions Planned/Expected for Subsequent Intakes: As per HEC criteria for supervision by PhD supervisors provided all requirements of regulatory bodies are met.
23	Referred by: (delete which is inapplicable) FBOS: (Indicate the FBOS meeting reference and Item No) BU-DHS – 27-(FBoS HS) / Held on 11 th March 2020
24	Complete Plan of Studies, inclusive of complete Roadmap: (Attach as Annex 'A') (see enclosed)
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (Attach as Annex 'A')

B.FINANCIAL DETAILS

1	Source of Funding: <ul style="list-style-type: none"> • BU: Fully/Partially: Fully • Public Sector (B1): Fully/Partially (provide complete details; attach MOU, agreement etc.) NIL • 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 Annual or Semester System: Semester Annual Number of Years: Two Semester: Number of Semester: Four Total Number of Credit Hours: 30
3	Expected fee to be charged based on Cost & Benefits Analysis: (show working) Per annum fee: 1 st semester= 247450 + 2 nd semester= 142450= 389900 x 04 candidates = 1559600 Fee rate per credit hour: 15050 in Fall 2020
4	Expected Number of students for 1st& 2nd Intakes: 08 then as per HEC criteria for supervision by PhD supervisors
B5	Expected Earning from first two Intakes (1st 2 years) (B5): (Show working) 1 st Intake (01 candidate) = 247450 x 04 candidates = 989800 2 nd Intake (01 candidate) = 254227 x 04 candidates = 1016908 1 st Intake + 2 nd Intake = 989800+1016908= 2006708
B6	Expected Earnings for the Next Five Years (B6): (show working)

	Batch-2= 2428360+ Batch-3= 2523160+Batch-4=2622760+Batch-5=2727280+ Batch-6= 2837080 Total income of 05 Batches: 13138640
B7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working) faculty and staff Honorarium to MPhil faculty @ <u>2000</u> and PhD faculty @ <u>2500</u> 1 st annum=18 CH x 16 weeks= 288x2500=720000 2 nd annum= 6 CH x 16 weeks= 96x2500=240000
B8	Cost of Additional Laboratory Equipment/Tools (B8): (show working) Nil
B9	Cost of Additional Classrooms (B9): (Include furniture, technical aids etc) Nil
B10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (show details) 10,000,00 in Phase 1
B11	Off-Site rental Expenses and Cost of other Fixtures : (Show details) Nil
B12	Miscellaneous Expenses required for Starting the Program: - Advertisement: 10,000,00 - Printing & Stationery = 30,000 - Admin Cost - Any other - Total =10,30,000 per batch
B13	Annual Recurring Expenditures in Subsequent Years: Salaries: Honorarium= 1 st Batch= 9,600,00 =5 batches x 9,600,00= 48,000,00 - Rentals: - Subscriptions/Memberships: - Advertisements: 5 batches x 10,000,00=50,000,00 - Printing & Stationery: 05 years x 30,000= 1,50,000 - Admin Cost - Any other - Total: 10% recurring = 4800000+5000000+150000= 99,500,00
B14	Total Cost of the Program (B14): [Add B(7) to B(12)] 9,600,00 + 10,300,00= 19,90,000 in Batch-1
B15	Net Cost of the Program (B15): [Subtract B(1) from B(14)] 19,90,000
16	Net Earnings in First 2 Years(B16: [Subtract B(15) from B(5)] 2006708-19,90,000=16708
17	Projected Annual Gross Earning in Subsequent Years (B 17): Batch-2= 2428360+ Batch-3= 2523160+Batch-4=2622760+Batch-5=2727280+ Batch-6=2837080 Total earning of 05 Batches: 1,31,38,640

18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] Total expenditures of 5 Batches= 99,500,00 =Total earning of 5 batches= 1,31,38,640-99,500,00= 31,88,640
----	---

ANNEXURE-A

**MPHIL PROGRAM BIOCHEMISTRY
BUMDC
JANUARY 2020**

VISION, MISSION, OBJECTIVES, OUTCOMES, RATIONALE, ROAD MAP & CURRICULUM

CONTENTS

I. VISION OF BIOCHEMISTRY PROGRAM

II. MISSION OF BIOCHEMISTRY PROGRAM

III. INTRODUCTION

1. Program Objectives
2. Program Outcomes
3. Program Organization: Semester System
4. Program Roadmap
5. List of Elective Course
6. Program Overview

IV. BIOCHEMISTRY PROGRAM CORE COURSES

1. MED-701: Research Methodology, Biostatistics & Epidemiology
2. MED-712: Medical Biology & Genetic
3. MED-713: Medical Education, Ethics & Writing
4. MED-714: Instruments and Animal use in research
5. MED-715,716&717: Journal Club
6. MED-718,719&720: Teaching internship
7. THS-700 & 701: Thesis I (THS 700) & II (THS 701)
8. BIO 750: General metabolism and biological oxidation
9. BIO 751: Clinical biochemistry and heme metabolism

V. BIOCHEMISTRY PROGRAM ELECTIVE COURSES

1. BIO 752: Chemical basis of life, Diet and Nutrition
2. BIO 753: Endocrinology
3. BIO 754: Water, electrolyte balance and imbalance

4. BIO 755: Enzymology and vitamins
5. BIO 756: Acid base disorders
6. BIO 757: Biochemistry of cancer
7. BIO 758: Mineral and detoxification

SECTION I: VISION OF MPHIL PROGRAM IN BIOCHEMISTRY BUMDC

To become a national and internationally recognized university that contributes towards the development of nation through excellence in education and research.

SECTION II: MISSION MPHIL PROGRAM IN BIOCHEMISTRY BUMDC

To attain highest standards of learning, teaching and transformative research in the field of human Biochemistry in health professional education.

SECTION III: INTRODUCTION

The Master of Philosophy (MPhil) degree program of Biochemistry at Bahria University Medical & Dental College aims to prepare postgraduates in health professional educational institutions, particularly in areas of basic health science teaching & research. This will promote faculty development in basic health sciences education, and provide opportunity for junior health sciences faculty including Bahria University Medical & Dental College (BUMDC) to enhance their professional career as a teacher and researcher in the field of basic health sciences.

PROGRAM OBJECTIVES:

At the end of program the MPhil graduate should be able to:

- a. Demonstrate professional attitudes and ethical values to fulfill social and professional responsibility to community.
- b. Apply critical inquiry for promotion of evidence based theoretical knowledge to practice
- c. Analyze the research skills including analytical, synthesis, application, implementation, quality and implications.
- d. Work as a responsible, effective teacher and researcher independently.
- e. Display interpersonal skills including communication with experts, self-critic, social skills, team work etc.
- f. Perform life-long learning skills by accepting one's limitations to knowledge and urge to continuously update the knowledge.
- g. Present research results in national / international scientific forums and publish in journals.

PROGRAM OUTCOMES:

The program is committed to produce:

- a. Teachers and researchers equipped with professional attitudes and ethical values to fulfill social and professional responsibility to community.
- b. Professionals inculcated with application of critical inquiry for promotion of evidence based theoretical knowledge for practice.
- c. Graduates equipped with analytical, synthesis, application implementation, quality, implications etc. skills
- d. Responsible, effective teachers and researchers in basic health sciences with ability to work independently
- e. Interpersonal skills in professionals including communication with experts, self-critic, social skills, team work etc.
- f. Life-long learning skills in professionals by accepting one's limitations to knowledge and urge to continuously update the knowledge.
- g. Good presenters of research results in national / international scientific forums along with publications in journals

MPhil PROGRAM: SEMESTER SYSTEM**3.1 STRUCTURE:**

Course title	MPhil • Biochemistry
Course duration	2years (max 4 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 hours of course work + 6 credit hours of research)
Credit hour distribution	Semester I= 9 Semester II= 9 Semester III=9 Semester IV=3

MPhil Basic Sciences Distribution of Credit Hours Course Work

Semester	Core Courses	Major	Research	Total
I	9	-	-	9
II	-	9	-	9
III	-	6	3	9
IV	-	-	3	3
TOTAL	9	15	6	30

MPHIL BIOCHEMISTRY PROGRAM – ROADMAP**Semester 1**

Sr. #	Course Code	Course Title	Credit Hours	Theory	Practical
1	MED 701	Research Methodology (University Requirement)	3+0	3	0
2	MED 712	Medical Biology & Genetics	2+0	2	0
3	MED 713	Medical Education, Ethics & Writing	2+0	2	0
4	MED 714	Instruments and Animal use in research	2(1+1)	1	1
5	MED 715	Journal Club (Essential)-1	No credit hour	0	0
6	MED 718	Teaching Internship (Essential)-1	No credit hour	0	0
Total Credit Hours in Semester-1			09	08	01

Semester 2

Sr. #	Course Code	Course Title	Credit Hours	Theory	Practical
1	BIO 750	General metabolism and biological oxidation	3+0	3	0
2	BIO 751	Clinical biochemistry and heme metabolism	3(2+1)	2	1
3	XXX XXX/ XXX XXX	Elective –I	3+0	3	0
4	MED 716	Journal Club (Essential)-2	No credit hour	0	0
5	MED 719	Teaching Internship (Essential)-2	No credit hour	0	0
Total Credit Hours in Semester-2			09	8	1

Semester 3

Sr. #	Course Code	Course Title	Credit Hours	Theory	Practical
1	XXX XXX/	Elective-II	3+0	3	0
2	XXX XXX/	Elective-III	3+0	3	0
3	THS 700	Thesis-I	3+0	3	0
4	MED 717	Journal Club (Essential)-3	No credit hour	0	0
5	MED 720	Teaching Internship (Essential)-3	No credit hour	0	0
Total Credit Hours in Semester-3			09	09	0

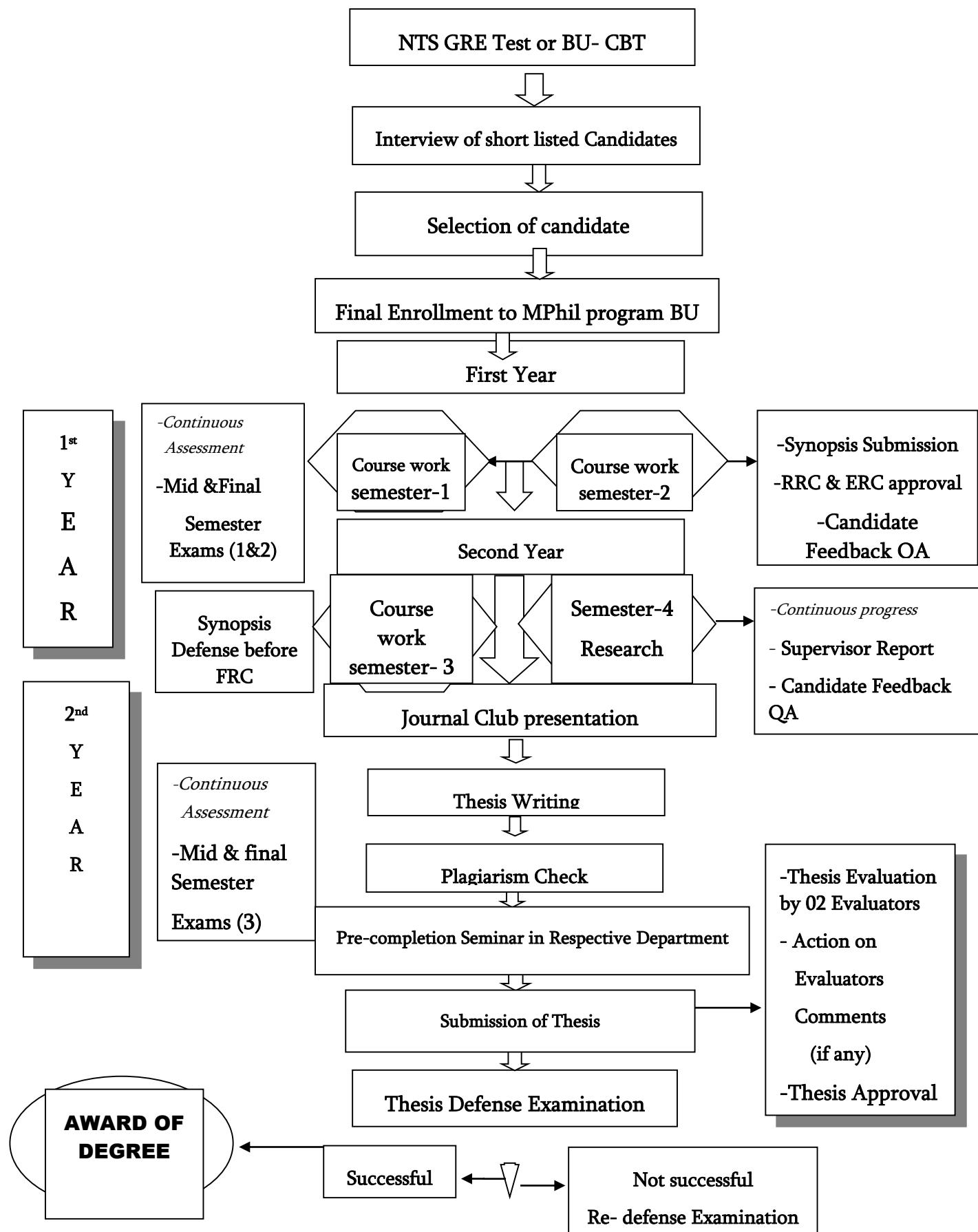
Semester 4

Sr. #	Course Code	Course Title	Credit Hours	Theory	Practical
1	THS 701	Thesis-II	3+0	3	0
Total			3+0	3	0
Total Credit Hours in Semester-4			3	3	0

LIST OF ELECTIVE COURSES

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1.	BIO 752	Chemical basis of life ,Diet and Nutrition	3(2+1)	2	1
2.	BIO 753	Endocrinology	3+0	3	0
3.	BIO 754	Water , electrolyte balance and imbalance	3+0	3	0
4.	BIO 755	Enzymology and vitamins	3+0	3	0
5.	BIO 756	Acid base disorders	3+0	3	0
6.	BIO 757	Biochemistry of cancer	3+0	3	0
7.	BIO 758	Mineral and detoxification	3+0	3	0

PROGRAM OVERVIEW



IV

BIOCHEMISTRY

PROGRAM

CORE COURSES

MED 701 [3+0 Credit hours]

RESEARCH METHODOLOGY, BIOSTATISTICS, EPIDEMIOLOGY:

Objectives:

1. Describe research, research methods and studies, their designs and work feasibility
2. Describe types of data and ways of data collection.
3. Manage organization, categorization, analyses and application 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
8. Understand the application of knowledge of epidemiology, research methodology and biostatistics in synopsis, thesis & research article writing

Learning Outcome:

Upon completion of course the students will be able to:

1. Acquire the basic knowledge of research, research studies, their designs and implementation
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 specifically SPSS 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
7. Apply knowledge of epidemiology, research methodology and biostatistics in synopsis, thesis & research article writing

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 biostatistics 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, distribution of samples and standard error, stratified random sampling, systematic and cluster sampling, statistical hypothesis, level and, test of significance, confidence interval, test involving binomial, normal and chi-square distribution, its properties and application, 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, , 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

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 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 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:

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 Guide for the care and use of laboratory animals . 8th edition. National Academies press. Washington DC.www.nap.edu

MED 715,716 & 717[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 718, 719 & 720 [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 ministerial 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 01**Thesis Research Work: [6 Credit hours]**

Title	General Metabolism and Biological Oxidation
Core Course	BIO 750
Credit hours	3+0
Pre-requisite	General concepts of biochemistry done at undergraduate level
Objectives	<ol style="list-style-type: none"> 1. Describe the digestion and absorption of carbohydrate, protein and lipids with their clinical significance. 2. Identify the mechanism leading to malabsorption 3. Explain glycolysis and TCA with their clinical correlation. 4. Explain gluconeogenesis with clinical significance. 5. Explain the biomedical importance of HMP shunt 6. Explain hemolysis in G6PD deficiency 7. Describe biomedical importance of uronic acid pathway 8. Explain fructose metabolism with its clinical significance. 9. Discuss the role of galactose and sorbitol in diabetes mellitus 10. Discuss glycogen metabolism with its clinical significance. 11. Discuss the regulation of blood glucose during well fed state and starvation 12. Explain the disorders of glucose metabolism. 13. Explain the endergonic and exergonic reactions with their clinical significance 14. Explain biological oxidation with clinical disorder. 15. Explain respiratory chain and oxidation phosphorylation 16. Explain the process of ATP synthesis 17. Explain uncouplers and inhibitors of oxidative phosphorylation 18. Explain the steps ,regulation , biomedical importance and clinical disorder of fatty acids synthesis 19. Describe the oxidation of fatty acid steps, regulation and its clinical disorders. 20. Describe the metabolism of cholesterol and its clinical disorders 21. Describe the metabolism of ketone bodies and its clinical importance 22. Describe the metabolism of lipoproteins and its clinical disorders 23. Correlate biochemical basis to the development of coronary heart disease and atherosclerosis 24. Discuss the metabolism and clinical disorders of Eicosanoids 25. Discuss the metabolism of phospholipids and its clinical significance 26. Explain the biochemical importance of Transamination and Deamination 27. Describe the mechanism of transport of ammonia and the formation of urea. 28. Discuss the effects ammonia toxicity on brain 29. Discuss the individual metabolism and their inherited disorders of the following:- Phenylalanine, tyrosine, methionine,cysteine, cystine, tryptophan, creatine,leucine, valine, isoleucine 30. Discuss the metabolism, biomedical importance and associated diseases of neurotransmitters 31. Acetylcholine ,glutamate ,GABA , glycine ,serotonin, dopamine

Course learning outcome	Upon completion of course the students will be able to: 1. Comprehend knowledge about the processes of metabolism of proteins, carbohydrates, lipids 2. Comprehend understandings of various inherited defects in metabolic pathways 3. Comprehend the basic knowledge of biological oxidation and oxidative phosphorylation												
Course outline	Concept of generation of energy by biological oxidation and electron transport chain, Digestion and absorption of proteins, bio-synthesis of various amino acids, catabolism of proteins and amino acid nitrogen, urea synthesis, catabolism of carbon skeleton of amino acids, synthesis of specialized products from amino acids, internal defects in metabolism of amino acids, digestion and absorption of carbohydrates, synthesis of glycogen, glycogenolysis, gluconeogenesis, aerobic and anaerobic glycolysis, Tricarboxylic acid cycle, hexose monophosphate pathway and interconversion of various monosaccharide and synthesis of amino sugars, Glycosaminoglycan and glucuronic acid. Digestion and absorption of lipids, transport of plasma lipids oxidation of fatty acids, synthesis of fatty acids, metabolism of ketone bodies and metabolism of cholesterol and metabolism of plasma lipoproteins.												
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. 6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. 7. Textbook of biochemistry devlin <p>Reference Books</p> <p>Lehnninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p>												
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th> <th>Course Contents</th> </tr> </thead> <tbody> <tr> <td>Week 1</td> <td>Describe the digestion and absorption of carbohydrate, protein and lipids with their clinical significance. Identify the mechanism leading to malabsorption</td> </tr> <tr> <td>Week 2</td> <td>Explain glycolysis and TCA with their clinical correlation. Explain gluconeogenesis with clinical significance</td> </tr> <tr> <td>Week 3</td> <td>Explain the biomedical importance of HMP shunt Explain hemolysis in G6PD deficiency. Quiz1</td> </tr> <tr> <td>Week 4</td> <td>Describe biomedical importance of uronic acid pathway Explain fructose metabolism with its clinical significance Assignment1</td> </tr> <tr> <td>Week 5</td> <td>Discuss the role of galactose and sorbitol in diabetes mellitus Discuss glycogen metabolism with its clinical significance.</td> </tr> </tbody> </table>	Week No	Course Contents	Week 1	Describe the digestion and absorption of carbohydrate, protein and lipids with their clinical significance. Identify the mechanism leading to malabsorption	Week 2	Explain glycolysis and TCA with their clinical correlation. Explain gluconeogenesis with clinical significance	Week 3	Explain the biomedical importance of HMP shunt Explain hemolysis in G6PD deficiency. Quiz1	Week 4	Describe biomedical importance of uronic acid pathway Explain fructose metabolism with its clinical significance Assignment1	Week 5	Discuss the role of galactose and sorbitol in diabetes mellitus Discuss glycogen metabolism with its clinical significance.
Week No	Course Contents												
Week 1	Describe the digestion and absorption of carbohydrate, protein and lipids with their clinical significance. Identify the mechanism leading to malabsorption												
Week 2	Explain glycolysis and TCA with their clinical correlation. Explain gluconeogenesis with clinical significance												
Week 3	Explain the biomedical importance of HMP shunt Explain hemolysis in G6PD deficiency. Quiz1												
Week 4	Describe biomedical importance of uronic acid pathway Explain fructose metabolism with its clinical significance Assignment1												
Week 5	Discuss the role of galactose and sorbitol in diabetes mellitus Discuss glycogen metabolism with its clinical significance.												

	<p>Week 6 Discuss the regulation of blood glucose during well fed state and starvation Explain the disorders of glucose metabolism. Quiz2</p> <p>Week 7 Explain the endergonic and exergonic reactions with their clinical significance Explain biological oxidation with clinical disorder</p> <p>Week 8 Explain respiratory chain and oxidation phosphorylation Explain the process of ATP synthesis</p> <p>Week 9 Mid-Term Exam</p> <p>Week 10 Explain uncouplers and inhibitors of oxidative phosphorylation Explain the steps ,regulation , biomedical importance and clinical disorder of fatty acids synthesis</p> <p>Week 11 Describe the oxidation of fatty acid steps, regulation and its clinical disorders. Describe the metabolism of cholesterol and its clinical disorders</p> <p>Week 12 Describe the metabolism of ketone bodies and its clinical importance Describe the metabolism of lipoproteins and its clinical disorders. QUIZ 3</p> <p>Week 13 Correlate biochemical basis to the development of coronary heart disease and atherosclerosis Discuss the metabolism and clinical disorders of Eicosanoids ASSIGNMENT 2</p> <p>Week 14 Discuss the metabolism of phospholipids and its clinical significance Explain the biochemical importance of Transamination and Deamination</p> <p>Week 15 Describe the mechanism of transport of ammonia and the formation of urea. Discuss the effects ammonia toxicity on brain. QUIZ 4</p> <p>Week 16 Discuss the individual metabolism and their inherited disorders of the following: Phenylalanine,tyrosine,methionine,cysteine,cystine,tryptophan,creatine, leucine, valine, isoleucine</p> <p>Week 17 Discuss the metabolism, biomedical importance and associated diseases of neurotransmitters</p>
--	---

	Acetylcholine ,glutamate ,GABA , glycine ,serotonin, dopamine Week 18 Semester Exam
Updated by:	Prof. Dr.Hasan Ali
Updated on:	16 th January 2020

V

BIOCHEMISTRY**PROGRAM****ELECTIVE COURSES**

Title	Chemical Basis of Life ,Diet and Nutrition
Core Course	BIO 752
Credit hours	3(2+1)
Pre-requisite	BIO 750 & 751
objectives	<ol style="list-style-type: none"> 1. Classify amino acids and their biomedical importance &explain the structure, physical, chemical properties and functions of amino acids 2. Classify proteins on the basis of functions, physical & chemical properties 3. Explain the structural levels of proteins and correlate the structural abnormalities of proteins 4. Explain the importance of proteins in nutrition 5. Define carbohydrate and its different classifications 6. Define the following terms: Stereoisomer, enantiomer, epimer, anomer, d & l sugars 7. Explain the structure, properties and function of Monosaccharides, Disaccharide , Oligosaccharide, polysaccharide 8. Explain the functions and clinical importance of different Glycosaminoglycan 9. Discuss the biomedical functions of lipids and their classifications. 10. Discuss the essential fatty acids and theirs biomedical importance 11. Explain the sources, properties, and biomedical role of cholesterol and TG. 12. Explain the role of different lipoproteins in the development of atherosclerosis. 13. Discuss the various properties of lipids such as saponification and rancidity. 14. Explain the biochemical role of eicosanoids 15. Discuss lipid per oxidation and its significance 16. Explain types of immunoglobulins on the basis of structure and their biochemical functions with their clinical disorders.

	<p>17. Define biochemical role of plasma protein with their clinical disorders</p> <p>18. Discuss human nutrition for healthy adults</p> <p>19. Comprehend the basic concepts of energy with regard to diet and nutritional aspects of various dietary components</p> <p>20. Discuss BMR,BMI and waist circumference with clinical importance</p> <p>21. Discuss glycemic index and glycemic load of food and its implications</p> <p>22. Describe methods used to assess nutritional status</p> <p>23. Discuss Diet and Nutrition with emphasis on concepts of energy, caloric requirements in pregnancy and lactation</p> <p>24. Discuss malnutrition, obesity and metabolic changes related to obesity</p> <p>25. Discuss the role of DASH diet in cardiovascular disorders</p> <p>26. Discuss the role of diet in renal failure</p> <p>27. Discuss the role of diet in dyslipidemia patient.</p> <p>28. Perform the qualitative analysis and interprets the results of given samples</p>				
Course learning outcome	<p>Upon completion of course the students will be able to:</p> <ol style="list-style-type: none"> 1. Comprehend the structure and function of proteins, carbohydrates and lipids 2. Understand the structure and functions of plasma proteins and immunoglobulins 3. Understand the biomedical basis of all nutritional deficiencies 4. Understand and interpretation of different qualitative analysis by performing different test 				
Course outline	The course will provide the knowledge of chemistry of carbohydrates, proteins, plasma protein, immunoglobulins and lipids, The course also provide knowledge of nutrition with the integrated overview of the physiological requirements and biochemical role of carbohydrates, lipids and proteins that are determinants of health and diseases in human populations.				
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. 6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. 7. Textbook of biochemistry devlin <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p> <p>Harrison Principles of internal Medicine Latest Ed. McGraw Hill</p> <p>Davidson and Passmore Human Nutrition and Dietetics Latest Ed.</p> <p>M.Swaminathan Principles of nutrition and dietetics Latest Ed.</p> <p>Bender DA. Bender AE Nutrition, A Reference Handbook Oxford University Press Latest Ed.</p>				
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th><th>Course Contents</th></tr> </thead> <tbody> <tr> <td>Week 1</td><td>Classify amino acids and their biomedical importance &explain the structure, physical, chemical properties and functions of amino acids</td></tr> </tbody> </table>	Week No	Course Contents	Week 1	Classify amino acids and their biomedical importance &explain the structure, physical, chemical properties and functions of amino acids
Week No	Course Contents				
Week 1	Classify amino acids and their biomedical importance &explain the structure, physical, chemical properties and functions of amino acids				

	<p>Classify proteins on the basis of functions, physical & chemical properties</p> <p>Week 2</p> <p>Explain the structural levels of proteins and correlate the structural abnormalities of proteins</p> <p>Explain the importance of proteins in nutrition</p> <p>Week 3</p> <p>Define carbohydrate and its different classifications</p> <p>Define the following terms: Stereoisomer, enantiomer, epimer, anomer, d & L sugars. QUIZ 1</p> <p>Week 4</p> <p>Explain the structure, properties and function of Monosaccharides, Disaccharide, Oligosaccharide, polysaccharide</p> <p>Explain the functions and clinical importance of different Glycosaminoglycan. ASSIGNMENT 1</p> <p>Week 5</p> <p>Discuss the biomedical functions of lipids and their classifications.</p> <p>Discuss the essential fatty acids and their biomedical importance</p> <p>Week 6</p> <p>Explain the sources, properties, and biomedical role of cholesterol and TG.</p> <p>Explain the role of different lipoproteins in the development of atherosclerosis. QUIZ 2</p> <p>Week 7</p> <p>Discuss the various properties of lipids such as saponification and rancidity.</p> <p>Explain the biochemical role of eicosanoids</p> <p>Week 8</p> <p>Discuss lipid per oxidation and its significance</p> <p>Explain types of immunoglobulins on the basis of structure and their biochemical functions with their clinical disorders.</p> <p>Week 9</p> <p>Mid-Term Exam</p> <p>Week 10</p> <p>Define biochemical role of plasma protein with their clinical disorders</p> <p>Discuss human nutrition for healthy adults</p> <p>Week 11</p> <p>Comprehend the basic concepts of energy with regard to diet and nutritional aspects of various dietary components</p> <p>Discuss BMR, BMI and waist circumference with clinical importance</p> <p>Week 12</p> <p>Discuss glycemic index and glycemic load of food and its implications</p> <p>Describe methods used to assess nutritional status. QUIZ 3</p>
--	---

	Week 13	Discuss Diet and Nutrition with emphasis on concepts of energy, caloric requirements in pregnancy and lactation Discuss malnutrition, obesity and metabolic changes related to obesity. ASSIGNMENT 2
	Week 14	Discuss the role of DASH diet in cardiovascular disorders Discuss the role of diet in renal failure
	Week 15	Discuss the role of diet in dyslipidemia patient. QUIZ 4
	Week 16	Perform the qualitative analysis and interprets the results of given samples
	Week 17	Revision
	Week 18	Semester Exam
Updated by:		Prof. Dr. Hasan Ali
Updated on:		16 th January 2020

Title	Endocrinology
Core Course	BIO 753
Credit hours	3+0
Pre-requisite	BIO- 750 & 751
objectives	<ol style="list-style-type: none"> 1. Describe how the hypothalamus regulates hormone in the body. 2. Discuss the hormones secreted by the pituitary gland, mechanism of action and regulation. 3. Describe the structure, biosynthesis, actions, regulations and disorders of growth hormone 4. Describe the structure, biosynthesis, actions, regulation and clinical use of Anti diuretic hormone 5. Discuss the regulation, function, metabolic role and disorders of thyroid hormones 6. Discuss the role of osteoblasts, osteoclasts, osteocytes, calcitropic hormones and vitamin D in bone remodeling 7. Describe the clinical feature of osteopenia, osteoporosis, fragility fractures and tetany 8. Explain the biosynthesis, pulsatile release, mechanism of action, regulation of secretion and destruction of insulin. 9. Discuss the mechanism of action, functions and metabolic role glucagon 10. Correlate effects of mineralocorticoids with salt and water retention in body 11. Discuss the effects of hyper and hyposecretion of Aldosterone 12. Describe the structure, biosynthesis, actions of Glucocorticoids and the role of ACTH in secretion of cortisol 13. Discuss clinical manifestations of hyper and hyposecretion of cortisol 14. Describe the clinical features of hyperaldosteronism and hypoaldosteronism 15. Explain the mechanism of action, metabolic role of estrogens and progesterones

	<p>16. Explain the metabolic role of oxytocin , prolactin, and estrogen 17. Explain the biosynthesis, mechanism of action and metabolic role of testosterone hormones effecting spermatogenesis. 18. Discuss the causes and biochemical basis of male and female infertility</p>														
Course learning outcome	Upon completion of course the students will be able to: 1. Comprehend basic knowledge of endocrine system and classification of hormones 2. Understand the structure and function of hormones 3. Comprehend basic knowledge of hormone biosynthesis, mechanism of action regulatory mechanisms and clinical disorders														
Course outline	The course will provide the knowledge of structure and functions of hormones. It will also include their synthesis, control of their syntheses, and mechanism of action of hormones. A detail about diseases related to hormone hypo and hyper secretions will also be included.														
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. 6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. 7. Textbook of biochemistry devlin <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed. Harrison Principles of internal Medicine Latest Ed. McGraw Hill Teit's Text Book of Clinical Chemistry Latest Ed.</p>														
Sixteen Week Lesson Plan:	<table border="0"> <thead> <tr> <th>Week No</th> <th>Course Contents</th> </tr> </thead> <tbody> <tr> <td>Week 1</td> <td>Describe how the hypothalamus regulates hormone in the body. Discuss the hormones secreted by the pituitary gland, mechanism of action and regulation.</td> </tr> <tr> <td>Week 2</td> <td>Describe the structure, biosynthesis, actions, regulations and disorders of growth hormone</td> </tr> <tr> <td>Week 3</td> <td>Describe the structure, biosynthesis, actions, regulation and clinical use of Anti diuretic hormone. QUIZ 1</td> </tr> <tr> <td>Week 4</td> <td>Discuss the regulation, function, metabolic role and disorders of thyroid hormones. ASSIGNMENT 1</td> </tr> <tr> <td>Week 5</td> <td>Discuss the role of osteoblasts, osteoclasts, osteocytes, calcitropic hormones and vitamin D in bone remodeling</td> </tr> <tr> <td>Week 6</td> <td>Describe the clinical feature of osteopenia, osteoporosis, fragility fractures and tetany. QUIZ 2</td> </tr> </tbody> </table>	Week No	Course Contents	Week 1	Describe how the hypothalamus regulates hormone in the body. Discuss the hormones secreted by the pituitary gland, mechanism of action and regulation.	Week 2	Describe the structure, biosynthesis, actions, regulations and disorders of growth hormone	Week 3	Describe the structure, biosynthesis, actions, regulation and clinical use of Anti diuretic hormone. QUIZ 1	Week 4	Discuss the regulation, function, metabolic role and disorders of thyroid hormones. ASSIGNMENT 1	Week 5	Discuss the role of osteoblasts, osteoclasts, osteocytes, calcitropic hormones and vitamin D in bone remodeling	Week 6	Describe the clinical feature of osteopenia, osteoporosis, fragility fractures and tetany. QUIZ 2
Week No	Course Contents														
Week 1	Describe how the hypothalamus regulates hormone in the body. Discuss the hormones secreted by the pituitary gland, mechanism of action and regulation.														
Week 2	Describe the structure, biosynthesis, actions, regulations and disorders of growth hormone														
Week 3	Describe the structure, biosynthesis, actions, regulation and clinical use of Anti diuretic hormone. QUIZ 1														
Week 4	Discuss the regulation, function, metabolic role and disorders of thyroid hormones. ASSIGNMENT 1														
Week 5	Discuss the role of osteoblasts, osteoclasts, osteocytes, calcitropic hormones and vitamin D in bone remodeling														
Week 6	Describe the clinical feature of osteopenia, osteoporosis, fragility fractures and tetany. QUIZ 2														

	Week 7 Explain the biosynthesis, pulsatile release, mechanism of action, regulation of secretion and destruction of insulin
	Week 8 Discuss the mechanism of action, functions and metabolic role glucagon
	Week 9 Mid-Term Exam
	Week 10 Correlate effects of mineralocorticoids with salt and water retention in body
	Week 11 Discuss the effects of hyper and hyposecretion of Aldosterone
	Week 12 Describe the structure, biosynthesis, actions of Glucocorticoids and the role of ACTH in secretion of cortisol QUIZ 3
	Week 13 Describe the clinical features of hyperaldosteronism and hypoaldosteronism. ASSIGNMENT 2
	Week 14 Explain the mechanism of action, metabolic role of estrogens and progesterones
	Week 15 Explain the metabolic role of oxytocin , prolactin, and estrogen Explain the biosynthesis, mechanism of action and metabolic role of testosterone hormones effecting spermatogenesis. QUIZ 4
	Week 16 Discuss the causes and biochemical basis of male and female infertility
	Week 17 Revision
	Week 18 Semester Exam
Updated by:	Prof. Dr. Hasan Ali
Updated on:	16 th January 2020

Title	Water, Electrolyte Balance and Imbalance
Core Course	BIO 754
Credit hours	3+0
Pre-requisite	BIO 750 & 751
objectives	<ol style="list-style-type: none"> 1. Discuss the different body compartments and distribution of water in these compartments 2. Explain the methods by which body water can be measured. 3. Study the types of solutes present in body fluids. 4. Discuss the electrolyte composition of ECF (plasma and tissue fluids) and ICF 5. Explain the movement or exchanges of water and electrolytes from one compartment to other in health. 6. Explain the mechanism of movement of electrolytes mainly sodium and potassium into the cells and out of the cells. 7. Describe the various sources of Intake of water. 8. Discuss the various processes by which water is lost from the body, i.e. output of water. 9. Explain the electrolyte balance is maintained in health and the organs principally involved. 10. Explain “internal circulation of salts” by GI tracts and kidneys. 11. Discuss various regulatory mechanisms that operate to maintain the homeostasis. 12. Explain the role of kinins and prostaglandins in water and electrolyte metabolism. 13. Discuss Abnormalities of water and electrolyte metabolism can produce: (a) dehydration (b) water intoxication. 14. Discuss the types , causes, nature, clinical findings, biochemical finding and mode of death in pure water depletion and pure salt depletion 15. Discuss the causes, pathophysiology, clinical and biochemical findings of dehydration 16. Explain the water and electrolyte imbalance Hypotonic expansion, isotonic expansion, hypertonic expansion, hypotonic contraction, isotonic contraction and hypertonic contraction. 17. Discuss water intoxication, its causes and clinical features. 18. Describe the biochemical basis,assessment and management of hypernatremia and hyponatremia

	19. Describe the biochemical basis, assessment and management of hypokalaemia and hyperkalaemia										
Course learning outcome	<ol style="list-style-type: none"> Upon completion of course the students will be able to Understand role of water and electrolytes in maintenance of homeostasis Comprehend mechanism of the exchange of water and electrolytes Understand the regulation of water in health and disease Understand biochemical basis of dehydration and water intoxication Comprehend biochemical basis of sodium and potassium disorders 										
Course outline	This course provide the knowledge of biochemical role of water in maintenance of homeostasis, also provides the concept of dehydration and water intoxication, regulation of water by different organs, effect of sodium and potassium disorder in water loss										
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> Harper's Illustrated Biochemistry Latest Ed. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. AS Saini Text Book of Biochemistry Latest Ed. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. Textbook of biochemistry devlin clinical biochemistry by allangaw ,micheal j murphy <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p> <p>Harrison Principles of internal Medicine Latest Ed. McGraw Hill</p>										
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th> <th>Course Contents</th> </tr> </thead> <tbody> <tr> <td>Week 1</td> <td>Discuss the different body compartments and distribution of water in these compartments Explain the methods by which body water can be measured</td> </tr> <tr> <td>Week 2</td> <td>Study the types of solutes present in body fluids. Discuss the electrolyte composition of ECF (plasma and tissue fluids) and ICF</td> </tr> <tr> <td>Week 3</td> <td>Explain the movement or exchanges of water and electrolytes from one compartment to other in health. QUIZ 1</td> </tr> <tr> <td>Week 4</td> <td>Explain the mechanism of movement of electrolytes mainly sodium and potassium into the cells and out of the cells.</td> </tr> </tbody> </table> <p>ASSIGNMENT 1</p>	Week No	Course Contents	Week 1	Discuss the different body compartments and distribution of water in these compartments Explain the methods by which body water can be measured	Week 2	Study the types of solutes present in body fluids. Discuss the electrolyte composition of ECF (plasma and tissue fluids) and ICF	Week 3	Explain the movement or exchanges of water and electrolytes from one compartment to other in health. QUIZ 1	Week 4	Explain the mechanism of movement of electrolytes mainly sodium and potassium into the cells and out of the cells.
Week No	Course Contents										
Week 1	Discuss the different body compartments and distribution of water in these compartments Explain the methods by which body water can be measured										
Week 2	Study the types of solutes present in body fluids. Discuss the electrolyte composition of ECF (plasma and tissue fluids) and ICF										
Week 3	Explain the movement or exchanges of water and electrolytes from one compartment to other in health. QUIZ 1										
Week 4	Explain the mechanism of movement of electrolytes mainly sodium and potassium into the cells and out of the cells.										

	Week 5 Describe the various sources of Intake of water
	Week 6 Discuss the various processes by which water is lost from the body, i.e. output of water. QUIZ 2
	Week 7 Explain the electrolyte balance is maintained in health and the organs principally involved
	Week 8 Explain “internal circulation of salts” by GI tracts and kidneys
	Week 9 Mid-Term Exam
	Week 10 Discuss various regulatory mechanisms that operate to maintain the homeostasis.
	Week 11 Explain the role of kinins and prostaglandins in water and electrolyte metabolism.
	Week 12 Discuss Abnormalities of water and electrolyte metabolism can produce: (a) dehydration (b) water intoxication. QUIZ 3
	Week 13 Discuss the types, causes, nature, clinical findings, biochemical finding and mode of death in pure water depletion and pure salt depletion. ASSIGNMENT 2
	Week 14 Discuss the causes, pathophysiology, clinical and biochemical findings of dehydration
	Week 15 Explain the water and electrolyte imbalance Hypotonic expansion, isotonic expansion, hypertonic expansion, hypotonic contraction, isotonic contraction and hypertonic contraction. Discuss water intoxication, its causes and clinical features QUIZ 4
	Week 16 Describe the biochemical basis, assessment and management of hypernatremia and hyponatremia Describe the biochemical basis, assessment and management of hypokalaemia and hyperkalaemia
	Week 17 Revision
	Week 18 Semester Exam
Updated by:	Prof. Dr. Hasan Ali
Updated on:	16 th January 2020

Title	Enzymology and Vitamins
Core Course	BIO 755
Credit hours	3+0
Pre-requisite	BIO 750 & 751
objectives	<ul style="list-style-type: none"> 1. Discuss enzymes, their general properties and classification. 2. Described the mechanisms of enzyme catalyzed reactions and various factors affecting enzyme activity. 3. Describe various types of enzyme inhibition and how the enzyme activity is regulated. 4. Discuss the various Isoenzymes with their Clinical Importance 5. Discuss the biochemical role and clinical aspect/ deficiencies of following vitamins : <ul style="list-style-type: none"> a)Fat soluble Vit: A,D,E,K b)Water soluble, Vitamin: Vit, C,B1, folic acid, thiamine, pyridoxine, riboflavin, nicotinic acid, pantothenic acid, biotin Vit B12.
Course learning outcome	Upon completion of course the students will be able to: <ul style="list-style-type: none"> 1. Comprehend basic knowledge about the classification, properties of enzymes and the relationship between their structure and mechanisms of action different enzymes 2. Know the most important representatives of individual enzyme classes, their use in clinical practice and basic methods for the determination of enzyme activity 3. Explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action 4. Explain isozymes and theirs clinical importance 5. Understand the role of fat and water soluble vitamins 6. Comprehend the deficiency and clinical diagnosis of vitamins
Course outline	The course will provide the knowledge of structure, classification, properties of enzymes, enzyme kinetics, factors affecting enzymes activity, enzyme inhibition, functions clinical and diagnostic importance of enzymes, co-enzymes and isoenzymes. This course will also provide information of biochemical role of water soluble and fat soluble vitamins along with their clinical disorders.

Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. 6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. 7. Textbook of biochemistry devlin <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p> <p>Harrison Principles of internal Medicine Latest Ed. McGraw Hill</p>
------------------	---

Sixteen Week Lesson Plan:	Week No	Course Contents
	Week 1	Discuss enzymes, their general properties and classification.
	Week 2	Described the mechanisms of enzyme catalyzed reactions and various factors affecting enzyme activity.
	Week 3	Describe various types of enzyme inhibition and how the enzyme activity is regulated. QUIZ 1
	Week 4	Discuss the biochemical role and clinical aspect/ deficiencies of A, D. ASSIGNMENT 1
	Week 5	Discuss the biochemical role and clinical aspect/ deficiencies of E, K.
	Week 6	Discuss the biochemical role and clinical aspect/ deficiencies of ascorbic acid QUIZ 2
	Week 7	Discuss the biochemical role and clinical aspect/ deficiencies of folic acid.
	Week 8	Discuss the biochemical role and clinical aspect/ deficiencies of thiamine.
	Week 9	Mid-Term Exam
	Week 10	Discuss the biochemical role and clinical aspect/ deficiencies of pyridoxine.
	Week 11	Discuss the biochemical role and clinical aspect/ deficiencies of riboflavin.
	Week 12	Discuss the biochemical role and clinical aspect/ deficiencies of nicotinic acid QUIZ 3
	Week 13	Discuss the biochemical role and clinical aspect/ deficiencies of pantothenic. ASSIGNMENT 2
	Week 14	Discuss the biochemical role and clinical aspect/ deficiencies of Biotin -1
	Week 15	Discuss the biochemical role and clinical aspect/ deficiencies of Biotin -2. QUIZ 4
	Week 16	Discuss the biochemical role and clinical aspect/ deficiencies of vitamin B ₁₂
	Week 17	Revision
	Week 18	Semester Exam
Updated by:	Prof. Dr. Hasan Ali	
Updated on:	16 th January 2020	

Title	Acid Base Disorders
Core Course	BIO 756
Credit hours	3+0
Pre-requisite	BIO 750 & 751
objectives	<ul style="list-style-type: none"> 1) Define pH and concept of pH &pK 2) Discuss the concept of acid & base. 3) Discuss the concept of Buffers & their mechanism of action 4) Discuss the respiratory regulation of pH with their respect to Action of Hemoglobin. 5) Discuss the Renal regulation of pH with respect to exertion of H⁺& generation of bicarbonate & exertion of Titratable Acid. 6) Discuss the renal regulation of pH with respect to excretion ammonium ions. 7) Discuss the causes & mechanism of Respiratory acidosis. 8) Discuss the compensatory process of respiratory acidosis. 9) Discuss the causes & mechanism of respiratory alkalosis 10) Discuss the compensatory phenomenon of respiratory alkalosis. 11) Discuss the causes & mechanism of metabolic alkalosis. 12) Discuss the compensatory phenomenon of metabolic alkalosis. 13) Discuss the cause & mechanism of metabolic acidosis 14) Discuss the compensatory phenomenon of metabolic acidosis. 15) Discuss the concept of Anion gap & its clinical interpretation.
Course learning outcome	Upon completion of course the students will be able to Comprehend basic knowledge of compensated and uncompensated clinical manifestation of alkalosis and acidosis Comprehend the role of buffer systems in normal and diseased states of the body Comprehend quality control, how to select reference individuals and interpret the reference ranges
Course outline	This course will provide the biochemical knowledge of the acid base disorder; Buffer systems, Conditions associated with abnormal acid base status, Graphic representation of acid bases of the blood, reference ranges
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and Dremasembulingan. Essentials of Medical Physiology Latest Ed..

	<p>6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed.</p> <p>7. Textbook of biochemistry devlin</p> <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p> <p>Harrison Principles of internal Medicine Latest Ed. McGraw Hill</p>																																				
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th><th>Course Contents</th></tr> </thead> <tbody> <tr> <td>Week 1</td><td>Define pH and concept of pH &pK</td></tr> <tr> <td>Week 2</td><td>Discuss the concept of acid & base.</td></tr> <tr> <td>Week 3</td><td>Discuss the concept of Buffers & their mechanism of action QUIZ 1</td></tr> <tr> <td>Week 4</td><td>Discuss the respiratory regulation of pH with respect to Action of Hemoglobin. ASSIGNMENT 1</td></tr> <tr> <td>Week 5</td><td>Discuss the Renal regulation of pH with respect to exertion of H⁺& generation of bicarbonate & exertion of Titratable Acid</td></tr> <tr> <td>Week 6</td><td>Discuss the renal regulation of pH with respect to excretion ammonium ions. QUIZ 2</td></tr> <tr> <td>Week 7</td><td>Discuss the causes & mechanism of Respiratory acidosis.</td></tr> <tr> <td>Week 8</td><td>Discuss the compensatory process of respiratory acidosis.</td></tr> <tr> <td>Week 9</td><td>Mid-Term Exam</td></tr> <tr> <td>Week 10</td><td>Discuss the causes & mechanism of respiratory alkalosis</td></tr> <tr> <td>Week 11</td><td>Discuss the compensatory phenomenon of respiratory alkalosis.</td></tr> <tr> <td>Week 12</td><td>Discuss the causes & mechanism of metabolic alkalosis.QUIZ 3</td></tr> <tr> <td>Week 13</td><td>Discuss the compensatory phenomenon of metabolic alkalosis.. ASSIGNMENT 2</td></tr> <tr> <td>Week 14</td><td>Discuss the cause & mechanism of metabolic acidosis</td></tr> <tr> <td>Week 15</td><td>Discuss the compensatory phenomenon of metabolic acidosis. QUIZ 4</td></tr> <tr> <td>Week 16</td><td>Discuss the concept of Anion gap & its clinical interpretation</td></tr> <tr> <td>Week 17</td><td>Revision</td></tr> </tbody> </table>	Week No	Course Contents	Week 1	Define pH and concept of pH &pK	Week 2	Discuss the concept of acid & base.	Week 3	Discuss the concept of Buffers & their mechanism of action QUIZ 1	Week 4	Discuss the respiratory regulation of pH with respect to Action of Hemoglobin. ASSIGNMENT 1	Week 5	Discuss the Renal regulation of pH with respect to exertion of H ⁺ & generation of bicarbonate & exertion of Titratable Acid	Week 6	Discuss the renal regulation of pH with respect to excretion ammonium ions. QUIZ 2	Week 7	Discuss the causes & mechanism of Respiratory acidosis.	Week 8	Discuss the compensatory process of respiratory acidosis.	Week 9	Mid-Term Exam	Week 10	Discuss the causes & mechanism of respiratory alkalosis	Week 11	Discuss the compensatory phenomenon of respiratory alkalosis.	Week 12	Discuss the causes & mechanism of metabolic alkalosis. QUIZ 3	Week 13	Discuss the compensatory phenomenon of metabolic alkalosis.. ASSIGNMENT 2	Week 14	Discuss the cause & mechanism of metabolic acidosis	Week 15	Discuss the compensatory phenomenon of metabolic acidosis. QUIZ 4	Week 16	Discuss the concept of Anion gap & its clinical interpretation	Week 17	Revision
Week No	Course Contents																																				
Week 1	Define pH and concept of pH &pK																																				
Week 2	Discuss the concept of acid & base.																																				
Week 3	Discuss the concept of Buffers & their mechanism of action QUIZ 1																																				
Week 4	Discuss the respiratory regulation of pH with respect to Action of Hemoglobin. ASSIGNMENT 1																																				
Week 5	Discuss the Renal regulation of pH with respect to exertion of H ⁺ & generation of bicarbonate & exertion of Titratable Acid																																				
Week 6	Discuss the renal regulation of pH with respect to excretion ammonium ions. QUIZ 2																																				
Week 7	Discuss the causes & mechanism of Respiratory acidosis.																																				
Week 8	Discuss the compensatory process of respiratory acidosis.																																				
Week 9	Mid-Term Exam																																				
Week 10	Discuss the causes & mechanism of respiratory alkalosis																																				
Week 11	Discuss the compensatory phenomenon of respiratory alkalosis.																																				
Week 12	Discuss the causes & mechanism of metabolic alkalosis. QUIZ 3																																				
Week 13	Discuss the compensatory phenomenon of metabolic alkalosis.. ASSIGNMENT 2																																				
Week 14	Discuss the cause & mechanism of metabolic acidosis																																				
Week 15	Discuss the compensatory phenomenon of metabolic acidosis. QUIZ 4																																				
Week 16	Discuss the concept of Anion gap & its clinical interpretation																																				
Week 17	Revision																																				

	Week 18 Semester Exam
Updated by:	Prof. Dr. Hasan Ali
Updated on:	16 th January 2020

Title	Biochemistry of Cancer
Core Course	BIO 757
Pre-requisite	BIO 750 & 751
Credit hours	3+0
objective	<ol style="list-style-type: none"> 1. What is cancer & its etiology? 2. Discuss the mechanism of action of different carcinogens 3. Discuss anti-mutagen & their mechanism. 4. Discuss oncogene and proto-oncogenes and their mechanism of transformation. 5. Discuss the mechanism of action of oncogenes 6. Discuss the tumor suppressor gene (anti-oncogenes) part -1 7. Discuss the tumor suppressor gene (anti-oncogenes) part -2 8. Discuss tumor makers & their clinical role in identification of diseases. 9. Discuss the apoptosis, its mechanism & role in cancer. 10. What is metastasis & its role in cancer? 11. Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action 12. Discuss the biochemical analysis of cancers. 13. Discuss the chemical correlation of oncogenic DNA viruses
Course learning outcome	<p>Upon completion of course the students will be able to:</p> <ol style="list-style-type: none"> 1. Describe what cancer is and how cancer cells grow, invade and metastasize 2. Understand the role of oncogenes, tumor suppressor genes, and growth factors in cancer initiation and progression 3. Understand the role of apoptosis in biochemistry and in carcinogenesis
Course outline	The course will provide the basic knowledge of growth and spread of cancer cells, their special properties of invading and metastasizing. It will also include the study of oncogenes, tumor suppressor genes, growth factor etc. The course will also provide knowledge regarding structural and morphological changes in apoptosis
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjee and Rana Shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K. Sembulingam and Dremasembulingam. Essentials of Medical Physiology Latest Ed..

	<p>6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed.</p> <p>7. Textbook of biochemistry devlin</p> <p>Reference Books</p> <p>Lehninger.Nelson and Cox. Principal of Biochemistry Latest Ed.</p> <p>Harrison Principles of internal Medicine Latest Ed. McGraw Hill</p>																																						
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th><th>Course Contents</th></tr> </thead> <tbody> <tr> <td>Week 1</td><td>What is cancer & its etiology?</td></tr> <tr> <td>Week 2</td><td>Discuss the mechanism of action different carcinogens</td></tr> <tr> <td>Week 3</td><td>Discuss anti-mutagen & their mechanism. QUIZ 1</td></tr> <tr> <td>Week 4</td><td>Discuss oncogene and proto-oncogen and their mechanism of transformation. ASSIGNMENT 1</td></tr> <tr> <td>Week 5</td><td>Discuss the mechanism of action of oncogenes</td></tr> <tr> <td>Week 6</td><td>Discuss the tumor suppressor gene (anti-oncogenes) part -1 QUIZ 2</td></tr> <tr> <td>Week 7</td><td>Discuss the tumor suppressor gene (anti-oncogenes) part -2</td></tr> <tr> <td>Week 8</td><td>Discuss tumor makers & their clinical role in identification of diseases</td></tr> <tr> <td>Week 9</td><td>Mid-Term Exam</td></tr> <tr> <td>Week 10</td><td>Discuss the apoptosis, its mechanism & role in cancer.</td></tr> <tr> <td>Week 11</td><td>What is metastases & its role in cancer?</td></tr> <tr> <td>Week 12</td><td>Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -1 QUIZ 3</td></tr> <tr> <td>Week 13</td><td>Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -2 ASSIGNMENT 2</td></tr> <tr> <td>Week 14</td><td>Discuss the biochemical analysis of cancers.</td></tr> <tr> <td>Week 15</td><td>Discuss the chemical correlation of oncogenic DNA Viruses-1. QUIZ 4</td></tr> <tr> <td>Week 16</td><td>Discuss the chemical correlation of oncogenic DNA Viruse-2.</td></tr> <tr> <td>Week 17</td><td>Revision</td></tr> <tr> <td>Week 18</td><td>Semester Exam</td></tr> </tbody> </table>	Week No	Course Contents	Week 1	What is cancer & its etiology?	Week 2	Discuss the mechanism of action different carcinogens	Week 3	Discuss anti-mutagen & their mechanism. QUIZ 1	Week 4	Discuss oncogene and proto-oncogen and their mechanism of transformation. ASSIGNMENT 1	Week 5	Discuss the mechanism of action of oncogenes	Week 6	Discuss the tumor suppressor gene (anti-oncogenes) part -1 QUIZ 2	Week 7	Discuss the tumor suppressor gene (anti-oncogenes) part -2	Week 8	Discuss tumor makers & their clinical role in identification of diseases	Week 9	Mid-Term Exam	Week 10	Discuss the apoptosis, its mechanism & role in cancer.	Week 11	What is metastases & its role in cancer?	Week 12	Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -1 QUIZ 3	Week 13	Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -2 ASSIGNMENT 2	Week 14	Discuss the biochemical analysis of cancers.	Week 15	Discuss the chemical correlation of oncogenic DNA Viruses-1. QUIZ 4	Week 16	Discuss the chemical correlation of oncogenic DNA Viruse-2.	Week 17	Revision	Week 18	Semester Exam
Week No	Course Contents																																						
Week 1	What is cancer & its etiology?																																						
Week 2	Discuss the mechanism of action different carcinogens																																						
Week 3	Discuss anti-mutagen & their mechanism. QUIZ 1																																						
Week 4	Discuss oncogene and proto-oncogen and their mechanism of transformation. ASSIGNMENT 1																																						
Week 5	Discuss the mechanism of action of oncogenes																																						
Week 6	Discuss the tumor suppressor gene (anti-oncogenes) part -1 QUIZ 2																																						
Week 7	Discuss the tumor suppressor gene (anti-oncogenes) part -2																																						
Week 8	Discuss tumor makers & their clinical role in identification of diseases																																						
Week 9	Mid-Term Exam																																						
Week 10	Discuss the apoptosis, its mechanism & role in cancer.																																						
Week 11	What is metastases & its role in cancer?																																						
Week 12	Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -1 QUIZ 3																																						
Week 13	Discuss biochemical base of anti-cancer drugs & their resistance involved in their mechanism of action part -2 ASSIGNMENT 2																																						
Week 14	Discuss the biochemical analysis of cancers.																																						
Week 15	Discuss the chemical correlation of oncogenic DNA Viruses-1. QUIZ 4																																						
Week 16	Discuss the chemical correlation of oncogenic DNA Viruse-2.																																						
Week 17	Revision																																						
Week 18	Semester Exam																																						

Updated by:	Prof. Dr. Hasan Ali
Updated on:	16 th January 2020

Title	Mineral and Detoxification								
Core Course	BIO 758								
Pre-requisite	BIO 750 & 751								
Credit hours	3+0								
objectives	<ol style="list-style-type: none"> 1. Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of: a)Macro mineral: sodium, potassium ,calcium,chloride,phosphate b)Micro mineral: iron,zinc,magnesium,selenium ,iodine, copper ,manganese 2. Explain different theories of detoxification 3. Describe the mechanism of detoxification as in found in oxidation,reduction,hydrolysis,conjugation 4. Describe the various type of conjugation reaction 5. Explain the mechanism of detoxification 6. Discuss the biomedical importance of mono-oxygenase CYP P450 system 								
Course learning outcome	Upon completion of course the students will be able to <ol style="list-style-type: none"> 1. Understand the role of macro and micro minerals in health and diseases 2. Understand mechanism and process of biotransformation and detoxification 								
Course outline	The course will provide the knowledge of different minerals and their biochemical role in health and diseases. This course also provide the knowledge of biotransformation of toxic compound into non toxic through different chemical reaction								
Resources	<p>Recommended Readings:</p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry Latest Ed. 2. M N Chatterjea and Rana shinde Text book of medical biochemistry Latest Ed. 3. Victor 1, Davidson and David B Sittna Biochemistry Latest Ed. 4. AS Saini Text Book of Biochemistry Latest Ed. 5. K.Sembulingan and DremaSembulingan. Essentials of Medical Physiology Latest Ed.. 6. DM Vasudevan and Streekumaris "Text book of biochemistry Latest Ed. 7. Textbook of biochemistry devlin <p>Reference Books</p> <p>Lehnninger.Nelson and Cox. Principal of Biochemistry Latest Ed. Harrison Principals of internal Medicine Latest Ed. McGraw Hill</p>								
Sixteen Week Lesson Plan:	<table> <thead> <tr> <th>Week No</th> <th>Course Contents</th> </tr> </thead> <tbody> <tr> <td>Week 1</td> <td>Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of sodium, potassium</td> </tr> <tr> <td>Week 2</td> <td>Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of calcium</td> </tr> <tr> <td>Week 3</td> <td>Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of chloride QUIZ 1</td> </tr> </tbody> </table>	Week No	Course Contents	Week 1	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of sodium, potassium	Week 2	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of calcium	Week 3	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of chloride QUIZ 1
Week No	Course Contents								
Week 1	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of sodium, potassium								
Week 2	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of calcium								
Week 3	Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of chloride QUIZ 1								

	<p>Week 4 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of phosphate ASSIGNMENT 1</p> <p>Week 5 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of iron</p> <p>Week 6 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of zincQUIZ 2</p> <p>Week 7 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of magnesium</p> <p>Week 8 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of selenium</p> <p>Week 9 Mid-Term Exam</p> <p>Week 10 Discuss the sources ,absorption, regulation, biochemical function and clinical aspect of iodine</p> <p>Week 11 Discuss the sources, absorption, regulation, biochemical function and clinical aspect of copper, manganese.</p> <p>Week 12 Explain different theories of detoxification QUIZ 3</p> <p>Week 13 Describe the mechanism of detoxification as found in oxidation, reduction, hydrolysis, conjugation ASSIGNMENT 2</p> <p>Week 14 Describe the various type of conjugation reaction</p> <p>Week 15 Explain the mechanism of detoxification. QUIZ 4</p> <p>Week 16 Discuss the biomedical importance of mono-oxygenase CYP P450 system</p> <p>Week 17 Revision</p> <p>Week 18 Semester Exam</p>
Updated by:	Prof. Dr. Hasan Ali
Updated on:	16 th January 2020

NEW PROGRAMME PROPOSAL - MPHIL IN PHYSIOLOGY

A.ACADEMIC DETAILS	
1	Faculty/Department: Faculty of Health Sciences – Medical College- Basic Health Sciences
2	Title of the Program: (to be printed on Degree/Transcript) MPhil in Physiology
3	Mission of the Program: To attain highest standards of learning, teaching and transformative research in the field of human Physiology in health professional education.
4	Objectives of the Program: At the end of program the MPhil graduate should be able to: <ol style="list-style-type: none"> Demonstrate professional attitudes and ethical values to fulfill social and professional responsibility to community. Apply critical inquiry for promotion of evidence based theoretical knowledge to practice Analyze the research skills including analytical, synthesis, application, implementation, quality and implications. Work as a responsible, dedicated teacher and keen researcher in an independent manner. Display interpersonal skills including self-critic, team work and communication. Perform life-long learning skills with an urge to continuously update the knowledge. Present research results in national / international scientific forums and publish in journals.
5	Outcomes of the Program: The program is committed to produce : <ol style="list-style-type: none"> Teachers and researchers equipped with professional attitudes and ethical values to fulfill social and professional responsibility to community. Professionals inculcated with application of critical inquiry for promotion of evidence based theoretical knowledge for practice. Graduates equipped with analytical, synthesis, application, implementation, quality, implications etc. skills in the field of Physiology. Responsible, effective teachers and researchers in basic health sciences with ability to work independently Interpersonal skills in professionals including communication with experts, self-critic, social skills, team work etc. Life-long learning skills in professionals by accepting one's limitations to knowledge and urge to continuously update the knowledge. Good presenters of research results in national / international scientific forums along with publications in journals
6	Rationale for the Program: There is scarcity of professionals in basic health sciences in the subject of Physiology in our country. MPhil program in Physiology will prepare postgraduates for health education institutions particularly in areas of basic science teaching and research. This will promote faculty development in basic health sciences education and will provide opportunity for junior medical, dental, nursing, physical therapy and allied health sciences faculty in the city/ province/ country

	including Bahria University Medical & Dental College (BUMDC)to enhance their professional career as a teacher and researcher in the field of basic health sciences.
7	Brief Description of the Program: The Master of Philosophy (MPhil) degree program of Physiology at Bahria University Medical & Dental College aims to prepare postgraduates in health professional educational institutions particularly in areas of basic health science teaching &research. This will promote faculty development in basic health sciences education, and provide opportunity for junior health sciences faculty including Bahria University Medical & Dental College (BUMDC) to enhance their professional career as a teacher and researcher in the field of basic health sciences.
8	Duration: 2 years
9	Venue(s): On Site/Off Site/Both On & Off Site (Tick one; if Off Site, give details) On site
10	Program Scheduling Format: Morning/Evening/Weekend (tick one) Morning Semester/Annual/ (tick one) Semester
11	Proposed Date of Commencement: Depends upon the NOC obtained from PMDC & HEC
12	Mode of Study/Examination: As per HEC semester based programs guidelines (Interactive lectures, cases, critical review, assignments, presentations, quizzes) (mid-term & final semester exam in each semester)
13	Additional Faculty Member(s) Required: (<i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i>) 01 Fulltime PhD in Physiology
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: Addition of book titles &journals as per HEC criteria.
18	Minimum Qualification for Admission: MBBS / BDS Eligibility criteria page # 14 MS/ MPhil Rules 2017
19	Admission Eligibility Criteria: (to be aligned with accreditation/regulatory bodies) Aligned with PMDC & HEC
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>) Nil

21	Number of Admissions Expected for First Intake: 04 (keeping in view admission in existing MPhil Programs)
22	Number of Admissions Planned/Expected for Subsequent Intakes: As per HEC criteria for supervision by PhD supervisors provided all requirements of regulatory bodies are met.
23	Referred by: <i>(delete which is inapplicable)</i> FBOS: <i>(Indicate the FBOS meeting reference and Item No)</i> BU-DHS – 27-(FBOS HS)/ Held on 11 th March 2020
24	Complete Plan of Studies, inclusive of complete Roadmap: <i>(Attach as Annex 'A')</i> (see enclosed)
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) <i>(Attach as Annex 'A')</i>

B.FINANCIAL DETAILS		
1	Source of Funding: <ul style="list-style-type: none"> • BU: Fully/Partially: Fully • Public Sector (B1): Fully/Partially (<i>provide complete details; attach MOU, agreement etc.</i>) NIL • 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: 2 years Annual Number of Years: Two Total Number of Credit Hours: 30	Annual or Semester System: Semester Semester: Number of Semester: Four
3	Expected fee to be charged based on Cost & Benefits Analysis: <i>(show working)</i> Per annum fee: 1 st semester= 247450 + 2 nd semester= 142450= 389900 x 04 candidates = 1559600	Fee rate per credit hour: 15050 in Fall 2020
4	Expected Number of students for 1st& 2nd Intakes: 08 then as per HEC criteria for supervision by PhD supervisors	
B5	Expected Earning from first two Intakes (1st 2 years) (B5): <i>(Show working)</i> 1 st Intake (01 candidate) = 247450 x 04 candidates = 989800 2 nd Intake (01 candidate) = 254227 x 04 candidates = 1016908 1 st Intake + 2 nd Intake = 989800+1016908= 2006708	
B6	Expected Earnings for the Next Five Years (B6): <i>(show working)</i> Batch-2= 2428360+ Batch-3= 2523160+Batch-4=2622760+Batch-5=2727280+ Batch-6=2837080 Total income of 05 Batches: 13138640	
B7	Total Estimated Salaries of all Additional Human Resources per annum (B7): <i>(Show working)</i> faculty and staff Honorarium to MPhil faculty @ <u>2000</u> and PhD faculty @ <u>2500</u> 1 st annum=18 CH x 16 weeks= 288x2500=720000	

	2 nd annum= 6 CH x 16 weeks= 96x2500=240000	
B8	Cost of Additional Laboratory Equipment/Tools (B8): <i>(show working)</i>	Nil
B9	Cost of Additional Classrooms (B9): <i>(Include furniture, technical aids etc)</i>	Nil
B10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): <i>(show details)</i> 10,000,00 in Phase 1	
B11	Off-Site rental Expenses and Cost of other Fixtures : <i>(Show details)</i> Nil	
B12	Miscellaneous Expenses required for Starting the Program: - Advertisement: 10,000,00	
	<ul style="list-style-type: none"> - Printing & Stationery = 30,000 - Admin Cost - Any other Total =10,30,000 per batch 	
B13	Annual Recurring Expenditures in Subsequent Years: Salaries: Honorarium= 1 st Batch= 9,600,00 $=5 \text{ batches} \times 9,600,00 = 48,000,00$ <ul style="list-style-type: none"> - Rentals: - Subscriptions/Memberships: - Advertisements: 5 batches x 10,000,00=50,000,00 - Printing & Stationery: 05 years x 30,000= 1,50,000 - Admin Cost - Any other - Total: 10% recurring = 4800000+5000000+150000= 99,500,00	
B14	Total Cost of the Program (B14): [Add B(7) to B(12)] 9,600,00 + 10,300,00= 19,90,000 in Batch-1	
B15	Net Cost of the Program (B15): [Subtract B(1) from B(14)] 19,90,000	
16	Net Earnings in First 2 Years(B16: [Subtract B(15) from B(5)] 2006708-19,90,000=16708	
17	Projected Annual Gross Earning in Subsequent Years (B 17): Batch-2= 2428360+ Batch-3= 2523160+Batch-4=2622760+Batch-5=2727280+ Batch-6=2837080 Total earning of 05 Batches: 1,31,38,640	
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17)] Total expenditures of 5 Batches= 99,500,00 =Total earning of 5 batches= 1,31,38,640-99,500,00= 31,88,640	

MPHIL PROGRAM PHYSIOLOGY

BUMDC

JANUARY 2020

VISION, MISSION, OBJECTIVES, OUTCOMES, RATIONALE, ROAD MAP & CURRICULUM

CONTENTS

I.VISION OF PHYSIOLOGY PROGRAM

II.MISSION OF PHYSIOLOGY PROGRAM

III.INTRODUCTION

- 1. Program Objectives**
- 2. Program Outcomes**
- 3. Program Organization: Semester System**
- 4. Program Roadmap**
- 5. List of Elective Courses**
- 6. Program Overview**

IV. PHYSIOLOGY PROGRAM CORE COURSES

- 1. MED 701: Research Methodology, Biostatistics & Epidemiology**
- 2. MED 712: Medical Biology & Genetics**
- 3. MED 713: Medical Education, Ethics & Writing**
- 4. MED 714: Instruments and Animal use in research**
- 5. MED 715,716&717: Journal Club**
- 6. MED 718,719&720: Teaching internship**
- 7. THS 700 & 701: Thesis I (THS 700) & II (THS 701)**
- 8. PHY 760: General, Neuromuscular and Blood Physiology**
- 9. PHY 761: Cardio-respiratory Physiology**

V. PHYSIOLOGY PROGRAM ELECTIVE COURSES

- 1. PHY 762: Physiology of Health, Fitness & Exercise**
- 2. PHY 763: Heme & Immune system**
- 3. PHY 764: Gastrointestinal Physiology**
- 4. PHY 765: Neurophysiology and special senses**
- 5. PHY 766: Renal Physiology**
- 6. PHY 767: Endocrine and Reproductive Physiology**
- 7. PHY 768: Electrophysiology**

SECTION I: VISION OF MPHIL PROGRAM IN PHYSIOLOGY BUMDC

To become an internationally recognized university that contributes towards the development of nation through excellence in education and research.

SECTION II: MISSION OF MPHIL PROGRAM IN PHYSIOLOGY BUMDC

To attain highest standards of learning, teaching and transformative research in the field of human Physiology in health professional education.

SECTION III: INTRODUCTION

The Master of Philosophy (MPhil) degree program of Physiology at Bahria University Medical & Dental College aims to prepare post-graduation health professional educational institutions particularly in areas of basic health science teaching &research. This will promote faculty development in basic health sciences education, and provide opportunity for junior health sciences faculty including Bahria University Medical & Dental College (BUMDC)to enhance their professional career as a teacher and researcher in the field of basic health sciences.

1. PROGRAM OBJECTIVES:

At the end of program the MPhil graduate should be able to:

- a. Demonstrate professional attitudes and ethical values to fulfill social and professional responsibility to community.
- b. Apply critical inquiry for promotion of evidence based theoretical knowledge to practice
- c. Analyze the research skills including analytical, synthesis, application, implementation, quality and implications.
- d. Work as a responsible, dedicated, effective teacher and keen researcher in an independent manner.
- e. Display interpersonal skills including self-critic, team work, communication with experts etc.
- f. Perform life-long learning skills with an urge to continuously update the knowledge.
- g. Present research results in national / international scientific forums and publish in journals.

2. PROGRAM OUTCOMES:

The program is committed to produce competent MPhil graduate to demonstrate:

- a. Professional attitudes and ethical values to fulfill social and professional responsibility to community
- b. The application of critical inquiry for promotion of evidence based theoretical knowledge to practice

- c. The ability to analyze the research skills including analytical, synthesis, application implementation, quality and implications
- d. Qualities of a responsible, dedicated effective teacher and keen researcher
- e. Interpersonal skills including communication with experts, self-critic, team work etc.
- f. Life-long learning skills with an urge to continuously update the knowledge
- g. The ability to work independently
- h. Presentation of research results in national / international scientific forums and publishing in journals

3. MPHIL PROGRAM: SEMESTER SYSTEM

Course title	MPhil ● Physiology
Course duration	2years (max 4 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 Basic Sciences Distribution of Credit Hours Course Work

Semester	Core Courses	Major	Research	Total
I	9	-	-	9
II	-	9	-	9
III	-	6	3	9
IV	-	-	3	3
TOTAL	9	15	6	30

4. MPHIL –PHYSIOLOGY PROGRAM – ROADMAP**SEMESTER- 1**

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1	MED 701	Research Methodology	3+0	3	0
2	MED 712	Medical Biology & Genetics	2+0	2	0
3	MED 713	Medical Education, Ethics & Writing	2+0	2	0
4	MED 714	Instruments & Animal use in research	2(1+1)	1	1
5	MED 715	Journal Club (Essential)-1	No credit hour	0	0
6	MED 718	Teaching Internship (Essential)-1	No credit hour	0	0
Total Credit Hours in Semester-1			09	08	1

SEMESTER- 2

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1	PHY 760	General ,Neuromuscular and Blood Physiology	3+0	3	0
2	PHY 761	Cardiorespiratory Physiology	3(2+1)	2	1
3	XXXXX	Elective -I	3+0	3	0
4	MED 716	Journal Club (Essential)-2	No credit hour	0	0
5	MED 719	Teaching Internship (Essential)-2	No credit hour	0	0
Total Credit Hours in Semester-2			09	08	1

SEMESTER -3

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1	XXXX	Elective-II	3+0	3	0
2	XXXXX	Elective-III	3+0	3	0
3	THS 700	Thesis-I	3+0	3	0
4	MED 717	Journal Club (Essential)-3	No credit hour	0	0
5	MED 720	Teaching Internship (Essential)-3	No credit hour	0	0
Total Credit Hours in Semester-3			09	09	0

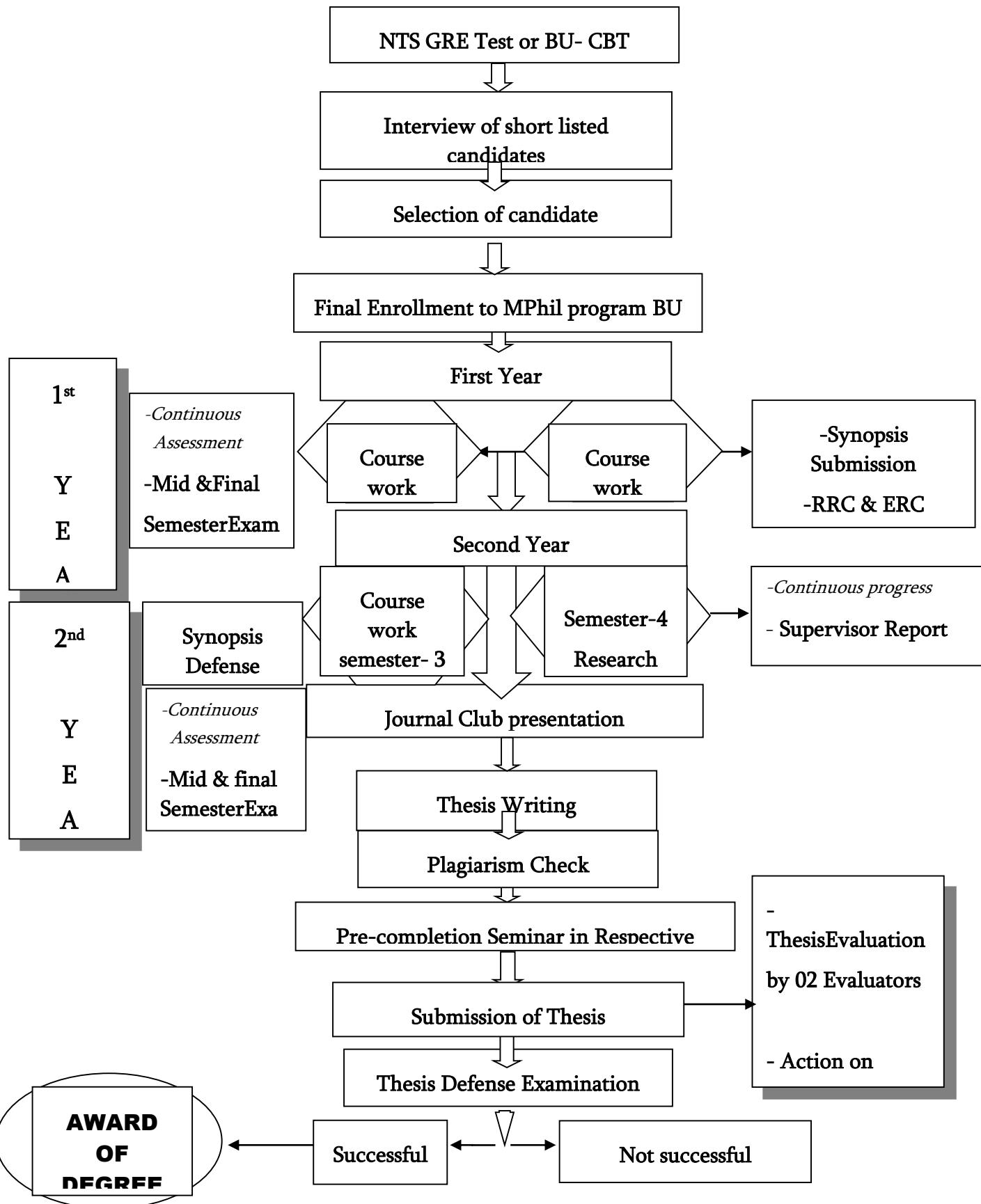
SEMESTER- 4

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1	THS 701	Thesis-II	3+0	3	0
		Total	3	3	0
		Total Credit Hours in Semester-4	3	3	0

LIST OF ELECTIVE COURSES

Sr.No.	Course Code	Course Title	Credit Hours	Theory	Practical
1.	PHY 762	Physiology of Health, Fitness& Exercise	3+0	3	0
2.	PHY 763	Heme & Immune system	3+0	3	0
3.	PHY 764	Gastrointestinal Physiology	3+0	3	0
4.	PHY 765	Neurophysiology and special senses	3+0	3	0
5.	PHY 766	Renal Physiology	3+0	3	0
6.	PHY 767	Endocrine and Reproductive Physiology	3+0	3	0
7.	PHY 768	Electrophysiology	3(1+2)	1	2

6. PROGRAM OVERVIEW



IV

PHYSIOLOGY

PROGRAM

CORE COURSES

MED 701 [3+0 Credit hours]

RESEARCH METHODOLOGY, BIOSTATISTICS, EPIDEMIOLOGY:

Objectives:

1. Describe research, research methods and studies, their designs and work feasibility
2. Describe types of data and ways of data collection.
3. Manage organization, categorization, analyses and application 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
8. Understand the application of knowledge of epidemiology, research methodology and biostatistics in synopsis, thesis & research article writing

Learning Outcome:

Upon completion of course the students will be able to:

1. Acquire the basic knowledge of research, research studies, their designs and implementation
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 specifically SPSS 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
7. Apply knowledge of epidemiology, research methodology and biostatistics in synopsis, thesis & research article writing

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 biostatistics 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, distribution of samples and standard error, stratified random sampling, systematic and cluster sampling, statistical hypothesis, level and, test of significance, confidence interval, test involving binomial, normal and chi-square distribution, its properties and application, 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, , 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 UniversityPress, 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. NewJersey USA.
8. Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, NewJersey USA.
9. Statistical Software: SPSS

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 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 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:

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 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, 716 & 717 [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:

5. Collect information from the available resources
6. Prepare a presentation on a given topic
7. Deliver a lecture and manage a question-answer session
8. 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 718, 719 & 720 [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]**

General, Neuromuscular and Blood Physiology	
Course Code:	PHY 760
Credit Hours:	3+0
Pre requisite:	Basic concepts of Cellular & Neuromuscular physiology, Homeostatic mechanisms, cell to cell communication and cell signaling
Objectives:	<ol style="list-style-type: none"> 1. Discuss homeostasis & homeostatic control mechanisms 2. Define negative feedback, positive feedback & feed forward mechanism and state an example. 3. Describe dynamics of cell membrane and cell organelles 4. Discuss different transport mechanisms across cell membrane 5. Discuss the different types of Bulk transport. 6. Discuss cytoskeletal elements including molecular motors. 7. Elaborate the cell to cell communication and cell signaling mechanisms 8. Discuss the underlying mechanisms for generation and maintenance of membrane potential and action potential 9. Classify the nerve fiber types according to myelination, diameter and conduction velocity. 10. Discuss structure of NMJ & Elaborate upon the sequence of events which cause transmission of impulse through NMJ & disorders 11. Discuss the classification and properties of muscles(skeletal, smooth and cardiac) 12. Describe the events leading to contraction and relaxation of skeletal and smooth muscles (on molecular basis) 13. Identify different neuromuscular disorders. 14. Elaborate the events of haemopoiesis. 15. Discuss the requirements for erythropoiesis and leucopoiesis
Course Learning Outcomes (CLOs):	<ol style="list-style-type: none"> 1. Comprehend the basic knowledge of principles of homeostasis, homeostatic control systems. 2. Comprehend basic principles of membrane transport and its characteristics.

	<ul style="list-style-type: none"> 3. Comprehend basic knowledge of molecular motors and role of microtubules in complex movements 4. Comprehend the basic knowledge of the structure and function of Neuromuscular junction 5. Discuss classification, mechanism of action & regulation of different hormones
Course Outline:	General concepts of homeostasis, consequences of disruption in homeostasis. General concepts of membrane transport. Carrier mediated transport, active transport,. Different types of vesicular transport. Concepts of molecular motors, microtubules. Concept of structure and function of Neuromuscular junction
Resources:	<p>Recommended Books:</p> <ul style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Human physiology by Rhoades 5. Clinical haematology by Hoffbrand 6. Greenspan's Basic and Clinical Endocrinology by David Gardner <p>Reference books: Priniciples of medicine by Davidson:latest edition</p> <p>Website: Medscape WEB MD</p>

Sixteen Week Lesson Plan:	Week No	Course Contents
	Week 1	Homeostasis & control system
	Week 2	Feedback mechanisms, feed forward mechanism
	Week 3	Cell organelles & their functions. QUIZ - 1
	Week 4	Physiological significance of cell membrane. ASSIGNMENT-1
	Week 5	Active & passive transport mechanisms
	Week 6	Bulk transport. QUIZ-2
	Week 7	Mechanisms for generation and maintenance of membrane potential and action potential
	Week 8	Cell junctions & molecular motors.
	Week 9	Mid-Term Exam
	Week 10	Neuromuscular transmission
	Week 11	Discuss classification of Muscles
	Week 12	Membrane dynamics. QUIZ - 3
	Week 13	Properties of muscles. ASSIGNMENT- 2
	Week 14	Mechanism of muscle contraction
	Week 15	Neuromuscular disorders QUIZ - 4
	Week 16	Haemopoiesis
	Week 17	Factors regulating erythropoiesis
	Week 18	Semester Exam
Updated By:	Prof. Dr.NighatRukhsana&Prof .Dr .ShaziaShakoor	
Updated on:	18 th Jan 2020	

Cardiorespiratory Physiology	
Course Code:	PHY 761
Credit Hours:	3(2+1)
Pre -requisite:	PHY 760
Objectives:	<ol style="list-style-type: none"> 1. Explain the properties of cardiac muscle 2. Explain the function of pacemaker, mechanism of self-excitation, rhythmicity, types of cardiac potentials. 3. Discuss the waves, intervals and segments of electrocardiography and disorders of cardiac rhythm 4. Discuss the dynamics of peripheral circulation, vascular resistance. 5. Explain the pathophysiology of different types of shock. 6. Describe volume and pressure changes during cardiac cycle.

	<p>7. Elaborate short term, intermediate and long-term mechanisms for regulation of blood pressure.</p> <p>8. Discuss the mechanics of respiration.</p> <p>9. Calculate the work of breathing by considering factors such as compliance, surface tension, surfactant & PFTs.</p> <p>10. Discuss ventilation perfusion ratio and its significance in normal and diseased conditions.</p> <p>11. Relate Henry's law, Dalton's law, Bohr and Haldane effect with relation to diffusion of gases</p> <p>12. Explain oxygen and carbon dioxide transport with respect to ventilation-perfusion ratio, respiratory quotient</p> <p>13. Predict how changes in blood pH, PCO₂ and temperature will affect oxygen-hemoglobin dissociation curve</p> <p>14. Discuss the causes and compensation of respiratory and metabolic acidosis and alkalosis</p> <p>15. Explain the regulation of depth and rate of respiration by nervous and chemical factors</p> <p>16. Discuss adaptation of respiratory system to exercise, higher altitudes, deep sea</p> <p>17. Study Lab Tutor Teaching Suite, Power Lab 15T, transducers and accessories</p> <p>18. Research USE: Human Physiology System II includes the Human Respiratory Kit for teaching spirometry and exercise physiology for the trainee researchers.</p>
Course learning outcomes (CLO):	Upon completion of the course the student should be able to: 1. Elaborate Cardiac muscle properties & conducting system 2. ECG & heart sounds 3. Cardiac cycle 4. Dynamics of Blood flow & Regulation of blood pressure 5. Diffusion & transport of gases 6. Regulation of respiration 7. Role of respiratory system & kidneys in maintenance of acid base balance
Course Outline:	Properties of cardiac muscles, conducting system, cardiac action potential, Blood pressure & its regulation, dynamics of blood flow and pathophysiology of shock .Diffusion & transport of gases, regulation of respiration, PFTs.
Resources:	Recommended Books: <ul style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Human physiology by Rhoades 5. Clinical haematology by Hoffbrand WEBSITE: Medscape Web MD

Sixteen Week Lesson Plan:	Week No	Course Contents
	Week 1	Explain the properties of cardiac muscle ,Cardiac action potential & conducting system
	Week 2	Electrocardiogram&Abnormalities
	Week 3	Cardiac Arrhythmias. QUIZ-1
	Week 4	Hemodynamics
	Week 5	Pathophysiology of different types of shock. ASSIGNMENT -1
	Week 6	Blood pressure regulation. QUIZ -2
	Week 7	events of cardiac cycle
	Week 8	Work of breathing & factors affecting it ,PFTs
	Week 9	Midterm Exam
	Week 10	Hypertension
	Week 11	transport of gases , Oxygen-Hb dissociation curve
	Week 12	Nervous & chemical regulation of respiration QUIZ- 3
	Week 13	Adaptation of respiratory system. ASSIGNMENT- 2
	Week 14	Describe the changes in respiration at higher altitudes, deep sea and in unusual environments
	Week 15	Hypoxia & its types. QUIZ-4
	Week 16	Respiratory distress syndrome in adults and infants.
	Week 17	Discussion &Presentations
	Week 18	Semester Exam
Updated By:	Prof. Dr. Nighat Rukhsana & Prof .Dr .Shazia Shakoor	
Updated on:	18 th January 2020	

V
PHYSIOLOGY
PROGRAM

ELECTIVE COURSES

Heme and Immune system	
Course Code	PHY 763
Credit Hours	3+0
Pre Requisite:	PHY 760 &PHY 761
	<ol style="list-style-type: none"> 1. Describe the pathophysiological significance of RBC count, hemoglobin level, packed cell volume, MCV, MCH,MCHC, RDW, differential leukocyte count and platelet count and correlate these to evaluate hematological disorders 2. Describe the different types of anemias based on incidence, etiology, pathophysiology and morphological features for characterization and in clinical decision making. 3. Explain the types of thalassemias based on pathophysiological mechanisms with respect to genetic and clinical features 4. Describe coagulation cascade. Discuss pertinent laboratory tests used to access coagulation function and correlate these with diseases of coagulation dysfunction. 5. Discuss bleeding disorders 6. Describe ABO and Rh blood groups and outline the mechanisms how a blood sample is typed. 7. Describe the hazards of blood transfusion and how these can be prevented. 8. Explain the underlying physiologic mechanisms that trigger an immune response in the body. 9. Describe the overview of immune system and allergic disorders. 10. Describe the role of immune system in allergic and immunological disorders
Course Learning Outcomes (CLOs)	<p>Upon completion of course the students will be able to:</p> <ol style="list-style-type: none"> 1. Comprehend basic knowledge of principles of blood Physiology, importance of Red cell indices to evaluate hematological disorders 2. Calculate the different red cell indices and their practical utility in clinical hematology. 3. Discuss the different types of anemias and their clinical and morphological features 4. Discuss the types of thalassemias based on genetic and clinical features. 5. Discuss the mechanisms how ABO and Rh blood groups are determined. 6. Understand the complications for mismatching blood transfusion. 7. Discuss the mechanism of specific and non-specific immunity in order to evaluate inflammatory response and complement functions. 8. Explain how the clotting cascade works and differentiate between intrinsic and extrinsic activation of complement system. 9. Discuss the mechanism of removal of clot. 10. Discuss the mechanisms that trigger an immune response and the conditions required for organ transplantation.
Course Outline :	Correlate the change in red cell indices in different clinical conditions, Anemia and its types, aplastic and hemolytic anemias, Blood grouping and transfusion reactions, haemostasis, blood coagulation cascade, blood clotting factors, coagulation dysfunctions fibrin and fibrinolysis. Qualitative and quantitative platelet disorders, differential diagnosis of platelet disorders, Immunity & its classification, Immunogens, Immunoglobulins, Antigen- antibody reactions, Immunocompetent cells in immune response, actions and products of immune

	system cells, histocompatibility antigens, hypersensitive reactions and pathophysiology of autoimmune disorders.
Resources:	<p>Recommended Books: (Latest Edition of all mentioned books should be referred)</p> <ol style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Human physiology by Rhoades 5. Clinical haematology by Hoffbrand
Sixteen Week Lesson Plan	<p>Week No: Course Contents</p> <p>Week 1 Pathophysiologic significance of Hb, red cell indices, DLC and PlateletCount</p> <p>Week 2 Classification of anemia based on incidence, etiology, pathophysiology & Morphological features</p> <p>Week 3 Pathophysiology, clinical features, genetic significance of thalassemia& Its types. QUIZ -1</p> <p>Week 4 Haemoglobinopathies. ASSIGNMENT- 1</p> <p>Week 5 Physiologic mechanisms of coagulation cascade and coagulation Dysfunction</p> <p>Week 6 Blood clotting factors and underlying mechanism from immediate actions to wound healing.QUIZ- 2</p> <p>Week 7 Thrombocytopenia, Platelet disorders based on clinical features and laboratory data</p> <p>Week 8 Blood grouping and its pathophysiology, mechanism how blood sample Is typed</p> <p>Week 9 Mid-Term Exam</p> <p>Week 10 Indications, contraindications, Prevention and hazards of blood Transfusion</p> <p>Week 11 Body defence and immune responses</p> <p>Week 12 Classification and pathophysiologic mechanisms of innate and adaptive Immunity.QUIZ -3</p> <p>Week 13 The role of immune cells and their communication in order to evaluate Hematological disorders.ASSIGNMENT- 2</p> <p>Week 14 The clinical features, differential diagnosis, pathophysiology and lab values for immunological disorders (2)</p> <p>Week 15 Hypersensitivity reactions.QUIZ-4</p> <p>Week 16 Transfusion reactions.</p> <p>Week 17 Discussion and Presentation</p> <p>Week 18 Semester Exam</p>
Up dared by:	Prof. Dr.Nighat Rukhsana & Prof .Dr .Shazia Shakoor
Updated on:	18 th January 2020

Gastrointestinal Physiology	
Course Code	PHY 764
Credit Hours	3+0
Pre-requisite	PHY 760 & PHY 761
Objectives	<ol style="list-style-type: none"> 1. Retrieve chewing, swallowing and esophageal peristalsis Classify 2. Discuss Pathophysiological mechanisms of dysphagia, achalasia and esophageal varices 3. Describe composition, formation and regulation of saliva production with pathophysiological mechanisms of mumps, sialolithiasis and dental caries 4. Gastrointestinal Reflexes with functions of gastrocolic reflex, gastroileal reflex 5. Explain Gastric secretion with pathophysiological mechanisms of gastroesophageal reflux disease and gastritis 6. Describe Pancreatic secretion with pathophysiological mechanisms of acute and chronic pancreatitis 7. Explain Composition and function of bile with pathophysiological mechanisms of cholecystitis and cholelithiasis 8. List metabolic functions of liver with pathophysiological mechanisms of types of jaundice and Hepatitis B and C 9. Discuss Applied Physiology of Gastrointestinal tract
Course Learning Outcomes (CLOs)	<p>At the end of the course the students should be able to:</p> <ol style="list-style-type: none"> 1. Comprehend basic knowledge of layers of GIT and innervation of GIT with disorders 2. Describe Gastrointestinal Motility with disorders 3. Discuss chewing, swallowing and oesophageal peristalsis with disorders 4. Classify Gastrointestinal Reflexes with clinical application 5. Characterize composition, formation and regulation of saliva production with disorders 6. Explain Gastric secretion with disorders 7. Describe Pancreatic secretion with disorders 8. Explain composition and function of bile with disorders 9. List metabolic functions of liver with disorders 10. Comprehend basic knowledge of vitamins and minerals 11. Recognize micronutrients and macronutrients 12. Identify nutritional deficiencies of vitamins, minerals, micronutrients and macronutrients 13. Recognize RDA Recommended Daily Allowance of each nutrient
Course Outline	General concepts of layers of GIT, extrinsic innervation and intrinsic innervation (enteric nervous system) with pathophysiological mechanisms of Megacolon or Hirschsprung's disease, Gastrointestinal Chewing, swallowing and oesophageal peristalsis with pathophysiological mechanisms of dysphagia, achalasia and oesophageal varices, Gastrointestinal, chewing, swallowing and oesophageal peristalsis, Gastrointestinal reflexes, Gastric secretion HCl secretion with pathophysiological mechanisms of peptic ulcer disease, gastroesophageal reflux disease and gastritis, Pancreatic secretion (composition, formation and secretion) with pathophysiological mechanisms of acute and chronic pancreatitis, metabolic functions of liver with pathophysiological mechanisms of types of jaundice and Hepatitis B and C, General concepts of water soluble and lipid soluble vitamins, sources of dietary intake, synthesis and absorption of vitamins and minerals,

	micronutrients and macronutrients. RDA Recommended Daily Allowance of each nutrient. Nutritional deficiencies of Scurvy, Beriberi, Pellagra, Xerophthalmia, megaloblastic anemia, pernicious anemia, iron deficiency anemia, rickets, osteomalacia
Resources:	<p>Recommended Books: (Latest Edition of all mentioned books should be referred)</p> <ol style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Physiology By Linda Costanzo 5. Human physiology by Rhoades
Sixteen Week Lesson Plan	<p>Week No:Course Contents</p> <p>Week 1 Layers of GIT and innervation of GIT</p> <p>Week 2 Chewing, swallowing and oesophageal peristalsis with pathophysiological mechanisms of dysphagia, achalasia and oesophageal varices</p> <p>Week 3 Composition, formation and regulation of saliva production with pathophysiological mechanisms of mumps, sialolithiasis and dental caries QUIZ-1</p> <p>Week 4 Basic mechanism of electrical activity in GIT smooth muscle ASSIGNMENT-1</p> <p>Week 5 Phases and regulation of gastric secretion.</p> <p>Week 6 GERD and acid peptic diseases.QUIZ-2</p> <p>Week 7 Gastrointestinal Hormones, Gastrin with pathophysiological mechanisms of Zollinger Ellison Syndrome, role of histamine in Peptic Ulcer Disease.</p> <p>Week 8 Pancreatic secretion with pathophysiological mechanisms of acute and chronic pancreatitis</p> <p>Week 9 Mid Term Exam</p> <p>Week 10 Composition and function of bile with pathophysiological mechanisms of cholecystitis and cholelithiasis</p> <p>Week 11 Metabolic functions of liver with pathophysiological mechanisms of types of jaundice and Hepatitis B and C</p> <p>Week 12 Extrinsic and intrinsic GIT reflexes.QUIZ-3</p> <p>Week 13 Classify Gastrointestinal Motility with pathophysiological mechanisms of types of diarrhea and constipation ASSIGNMENT-2</p> <p>Week 14 Inflammatory Bowel Disease (Ulcerative colitis and Crohn's disease) and Irritable Bowel Syndrome.</p> <p>Week 15 Classify Gastrointestinal Reflexes with functions of vomiting, gastrocolic reflex, gastroileal reflex QUIZ-4</p> <p>Week 16 Causes of diarrhea and constipation.</p> <p>Week 17 Discussion and Presentation</p> <p>Week 18 Semester Exam</p>
Up dated by:	Prof. Dr.Nighat Rukhsana & Prof .Dr .Shazia Shakoor
Updated on:	18 th January 2020

Neurophysiology	
Course code	PHY 765
Credit hours	3+0
Pre-requisites	PHY 760 &PHY 761
Objectives	<ol style="list-style-type: none"> 1. Classify sensory receptors on the basis of location, adaptation and functions 2. Explain the mechanism for transmission of sensory modalities 3. Identify and differentiate functions and properties of pyramidal and extrapyramidal tracts 4. Explain Physiological mechanisms involved in pain perception and transmission 5. Discuss Physiological mechanisms involved in analgesia 6. Classify pain and elaborate different types of pain 7. How is cerebral cortex organized into functional areas 8. Discuss role of cerebellum in coordination and execution of movements 9. Discuss role of cerebellum in the maintenance of equilibrium and balance in coordination with internal ear 10. Enlist different components of basal ganglia and role of basal ganglia in controlling movements 11. Classify spinal reflexes 12. Role of muscle spindle and golgi tendon organ in initiation and propagation of reflexes 13. Classify memory and how do learning and memory change synaptic connection in brain. 14. Discuss physiological mechanisms involved in speech vocalization 15. Elaborate parts and functions of limbic system 16. Discuss functions of higher brain centers (thalamus, hypothalamus) 17. Describe the appropriate use of neuro-diagnostic tests, namely EEG, EMG, CT and MRI and CSF analysis. 18. Discuss different components and functions of brain stem 19. Discuss the mechanisms of photo reception and photo transduction 20. Explain visual pathway with its clinical significance 21. How does the auditory system receives and process information from environment 22. How does vestibular system sense the position and motion of the head in gravitational field. 23. How are smells detected and how is this information processed 24. How are different tastes detected and how is this information processed 25. Discuss the role of reticular activating system and EEG during different stages of sleep
Course Learning Outcomes (CLO's)	<p>Upon completion of course the students will be able to :</p> <ol style="list-style-type: none"> 1. Appreciate the physiological significances of meninges, cerebrum, cerebellum, brainstem and diencephalon. 2. Summarize various sensory modalities, their transduction, transmission and sensation, 3. Identify different receptors available in special sense organs, mechanism of stimulation and processing of signals, 4. Compare and contrast the sensory processes in the related senses of smell and taste, Physiology of autonomic nervous system

Course outline	Localization of lesion, epilepsy, stroke, movement disorders, multiple sclerosis, pediatric neurology, raised intracranial pressure, intracranial hemorrhage, concussion, radiculopathy, spinal cord compression, neocortical emergencies.																																						
Resources	<p>Recommended Books: Latest Edition of all mentioned books should be referred)</p> <ol style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Human physiology by Rhoades 5. Clinical Anatomy by Snell's <p>REFERENCE BOOK: Principles of medicine by Davidson:latest edition</p> <p>WEBSITE: MEDSCAPE WEB MD</p>																																						
Sixteen week lesson plan	<table> <thead> <tr> <th>Week No</th> <th>Course Content</th> </tr> </thead> <tbody> <tr> <td>Week 1</td> <td>Sensory receptors and somatosensory tracts</td> </tr> <tr> <td>Week 2</td> <td>Motor system</td> </tr> <tr> <td>Week 3</td> <td>Protective mechanisms of brain(CSF, Blood brain barrier).QUIZ-1</td> </tr> <tr> <td>Week 4</td> <td>Analgesic mechanisms.ASSIGNMENT- 1</td> </tr> <tr> <td>Week 5</td> <td>Pain physiology</td> </tr> <tr> <td>Week 6</td> <td>Cerebral cortex.QUIZ-2</td> </tr> <tr> <td>Week 7</td> <td>Indications for CT ,MRI imaging of brain and spine, EEG and lumbar puncture in neurological disorders.</td> </tr> <tr> <td>Week 8</td> <td>Cerebellum,Basal ganglia and Parkinson's disease</td> </tr> <tr> <td>Week9</td> <td>Midterm Exam</td> </tr> <tr> <td>Week 10</td> <td>Superficial and deep reflexes.</td> </tr> <tr> <td>Week 11</td> <td>Learning and memory</td> </tr> <tr> <td>Week 12</td> <td>Physiology of articulation and speech.QUIZ- 3</td> </tr> <tr> <td>Week 13</td> <td>Vision and errors of refractionASSIGNMENT -2</td> </tr> <tr> <td>Week14</td> <td>Taste and smell</td> </tr> <tr> <td>Week 15</td> <td>Autonomic nervous system.QUIZ- 4</td> </tr> <tr> <td>Week 16</td> <td>Hearing and balance.</td> </tr> <tr> <td>Week 17</td> <td>Hypothalamus, thalamus and limbic system</td> </tr> <tr> <td>Week 18</td> <td>Semester Exam</td> </tr> </tbody> </table>	Week No	Course Content	Week 1	Sensory receptors and somatosensory tracts	Week 2	Motor system	Week 3	Protective mechanisms of brain(CSF, Blood brain barrier). QUIZ-1	Week 4	Analgesic mechanisms. ASSIGNMENT- 1	Week 5	Pain physiology	Week 6	Cerebral cortex. QUIZ-2	Week 7	Indications for CT ,MRI imaging of brain and spine, EEG and lumbar puncture in neurological disorders.	Week 8	Cerebellum,Basal ganglia and Parkinson's disease	Week9	Midterm Exam	Week 10	Superficial and deep reflexes.	Week 11	Learning and memory	Week 12	Physiology of articulation and speech. QUIZ- 3	Week 13	Vision and errors of refraction ASSIGNMENT -2	Week14	Taste and smell	Week 15	Autonomic nervous system. QUIZ- 4	Week 16	Hearing and balance.	Week 17	Hypothalamus, thalamus and limbic system	Week 18	Semester Exam
Week No	Course Content																																						
Week 1	Sensory receptors and somatosensory tracts																																						
Week 2	Motor system																																						
Week 3	Protective mechanisms of brain(CSF, Blood brain barrier). QUIZ-1																																						
Week 4	Analgesic mechanisms. ASSIGNMENT- 1																																						
Week 5	Pain physiology																																						
Week 6	Cerebral cortex. QUIZ-2																																						
Week 7	Indications for CT ,MRI imaging of brain and spine, EEG and lumbar puncture in neurological disorders.																																						
Week 8	Cerebellum,Basal ganglia and Parkinson's disease																																						
Week9	Midterm Exam																																						
Week 10	Superficial and deep reflexes.																																						
Week 11	Learning and memory																																						
Week 12	Physiology of articulation and speech. QUIZ- 3																																						
Week 13	Vision and errors of refraction ASSIGNMENT -2																																						
Week14	Taste and smell																																						
Week 15	Autonomic nervous system. QUIZ- 4																																						
Week 16	Hearing and balance.																																						
Week 17	Hypothalamus, thalamus and limbic system																																						
Week 18	Semester Exam																																						
Prepared by	Prof Dr.Nighat Rukhsana & Prof .Dr .Shazia Shakoor																																						
Date:	18 th January 2020																																						

Renal Physiology	
Course Code	PHY 766
Credit Hours	3+0
Pre Requisite:	PHY 760 &PHY 761
Objectives:	<ol style="list-style-type: none"> 1. Describe the basics of water and volume balance and associated with pathophysiological basis of sunstroke and volume depletion leading to dehydration. 2. Discuss functional and structural unit of kidney (Nephron)& its types 3. Describe the mechanisms which control glomerular blood flow and filtration. 4. Discuss renal tubular reabsorption 5. Explain renal clearance and its measurements in order to calculate the clearance of any given substance. 6. Discuss role of kidneys in establishment of corticopapillary osmotic gradient 7. Describe the pathophysiology, diagnosis and management of acute and chronic kidney disease, proteinuria, hematuria, primary and secondary hypertension, fluid and electrolyte and acid base disorders. 8. Describe the indications for hemodialysis, peritoneal dialysis, ultrafiltration, hemoperfusion and renal transplantation. 9. Describe the indications and limitations of imaging studies in urologic disease. 10. Discuss the indications and interpretation of renal biopsy. 11. Describe the complications of chronic kidney disease such as hypertension, anemia, mineral metabolism abnormalities, electrolyte disturbances and volume overload. 12. Delineate the mechanisms involved in aldosterone induced changes in Na excretion and discuss the pathophysiological basis of conn syndrome, Hyperaldosteronism and hypoaldosteronism. 13. Elaborate role of kidneys in maintenance of acid base balance 14. Explain micturition reflex and its regulation by autonomic nervous system
Course Learning Outcomes (CLOs)	<p>Upon completion of course the students should be able to:</p> <ol style="list-style-type: none"> 1. Describe the various parts of nephron and renal corpuscle. 2. Define glomerular filtrate & explain starling forces that affect glomerular filtration rate and its regulation 3. Discuss renal tubular reabsorption of various organic and inorganic substances & renal clearance. 4. Counter current mechanism 5. Identify the different stages of chronic kidney diseases 6. Understand the clinical features and management of common renal syndromes including acute kidney injury and chronic renal failure, glomerulonephritis and nephrotic syndrome 7. Understand and interpret lab tests, medical imaging and diagnostic studies employed in the assessment of renal function. 8. Understand the diagnosis and management of fluid , electrolyte and acid base disorders 9. Understand the diagnosis and management of primary and secondary hypertension. 10. Discuss the pathophysiological mechanisms (Glomerular filtration, selective reabsorption and tubular secretion) involved in urine formation.

Course Outline :	Acute kidney injury, Acid base disorders, fluid and electrolyte disorders, Primary and secondary arterial hypertension, dysuria, UTI, Glomerular disorders, nephrotic syndrome, nephrolithiasis, obstructive uropathy, pyelonephritis, poly cystic kidney disease, hypertensive and diabetic nephropathy, renal artery stenosis and dialysis in the treatment of renal failure.																																				
Resources:	<p>Recommended Books: (Latest Edition of all mentioned books should be referred)</p> <ul style="list-style-type: none"> 1. Guyton and Hall Text book of Physiology 2. Review of Medical Physiology by W. F. Ganong 3. Human Physiology by Lauralee Sherwood 4. Human physiology by Rhoades 5. Physiology by Linda S Costanzo 																																				
Sixteen Week Lesson Plan :	<p>Week No:Course Contents</p> <table> <tr> <td>Week 1</td> <td>Glomerular blood flow, Glomerular filtration rate,</td> </tr> <tr> <td>Week 2</td> <td>Tubular handling of glomerular filtrate</td> </tr> <tr> <td>Week 3</td> <td>Factors modifying Fluid and electrolytedisturbances. QUIZ -1</td> </tr> <tr> <td>Week 4</td> <td>Role of Juxtaglomerular apparatus. ASSIGNMENT- 1</td> </tr> <tr> <td>Week 5</td> <td>Renal plasmaclearance</td> </tr> <tr> <td>Week 6</td> <td>Clinical significance of glomerular basement membrane and Nephron. QUIZ- 2</td> </tr> <tr> <td>Week 7</td> <td>Countercurrent mechanisms</td> </tr> <tr> <td>Week 8</td> <td>Role of kidney in acid base balance</td> </tr> <tr> <td>Week 9</td> <td>Mid-Term Exam</td> </tr> <tr> <td>Week 10</td> <td>Micturition</td> </tr> <tr> <td>Week 11</td> <td>Renal disorders</td> </tr> <tr> <td>Week 12</td> <td>Complications of Chronic kidney disease (1) Mineral metabolism abnormalities &Electrolytedisturbances QUIZ-3</td> </tr> <tr> <td>Week 13</td> <td>Role of kidney in maintenance of Acid base disorders. ASSIGNMENT- 2</td> </tr> <tr> <td>Week 14</td> <td>Assessment of renal functions.</td> </tr> <tr> <td>Week 15</td> <td>Pathophysiology of Hemodialysis, Peritoneal dialysis. QUIZ-4</td> </tr> <tr> <td>Week 16</td> <td>Indications of renal transplant.</td> </tr> <tr> <td>Week 17</td> <td>Discussion and Presentation</td> </tr> <tr> <td>Week 18</td> <td>Semester Exam</td> </tr> </table>	Week 1	Glomerular blood flow, Glomerular filtration rate,	Week 2	Tubular handling of glomerular filtrate	Week 3	Factors modifying Fluid and electrolytedisturbances. QUIZ -1	Week 4	Role of Juxtaglomerular apparatus. ASSIGNMENT- 1	Week 5	Renal plasmaclearance	Week 6	Clinical significance of glomerular basement membrane and Nephron. QUIZ- 2	Week 7	Countercurrent mechanisms	Week 8	Role of kidney in acid base balance	Week 9	Mid-Term Exam	Week 10	Micturition	Week 11	Renal disorders	Week 12	Complications of Chronic kidney disease (1) Mineral metabolism abnormalities &Electrolytedisturbances QUIZ-3	Week 13	Role of kidney in maintenance of Acid base disorders. ASSIGNMENT- 2	Week 14	Assessment of renal functions.	Week 15	Pathophysiology of Hemodialysis, Peritoneal dialysis. QUIZ-4	Week 16	Indications of renal transplant.	Week 17	Discussion and Presentation	Week 18	Semester Exam
Week 1	Glomerular blood flow, Glomerular filtration rate,																																				
Week 2	Tubular handling of glomerular filtrate																																				
Week 3	Factors modifying Fluid and electrolytedisturbances. QUIZ -1																																				
Week 4	Role of Juxtaglomerular apparatus. ASSIGNMENT- 1																																				
Week 5	Renal plasmaclearance																																				
Week 6	Clinical significance of glomerular basement membrane and Nephron. QUIZ- 2																																				
Week 7	Countercurrent mechanisms																																				
Week 8	Role of kidney in acid base balance																																				
Week 9	Mid-Term Exam																																				
Week 10	Micturition																																				
Week 11	Renal disorders																																				
Week 12	Complications of Chronic kidney disease (1) Mineral metabolism abnormalities &Electrolytedisturbances QUIZ-3																																				
Week 13	Role of kidney in maintenance of Acid base disorders. ASSIGNMENT- 2																																				
Week 14	Assessment of renal functions.																																				
Week 15	Pathophysiology of Hemodialysis, Peritoneal dialysis. QUIZ-4																																				
Week 16	Indications of renal transplant.																																				
Week 17	Discussion and Presentation																																				
Week 18	Semester Exam																																				
Prepared by	Prof Dr.Nighat Rukhsana & Prof .Dr .Shazia Shakoor																																				
Date:	18 th January 2020																																				

Endocrine and Reproductive Physiology											
Course code	PHY 767										
Credit hours	3+0										
Pre requisite	PHY 760 &PHY 761https://en.wikipedia.org/wiki/Central_dogma_of_molecular_biology										
Objectives	<ol style="list-style-type: none"> 1. Discuss the classification, mechanism of action and regulation of hormones 2. Explain hypothalamic hormonal regulation of hormones 3. Enlist and discuss hormones of anterior pituitary glands 4. Discuss hormones of posterior pituitary gland 5. Discuss growth hormone and its disorders 6. Discuss Diabetes Insipidus and its types 7. Discuss synthesis and control of thyroid hormones 8. Discuss Hyper and hypothyroid conditions 9. Describe adrenocortical hormones 10. Explain Cushing syndrome ,Cushing disease, Cushing's disease,Addison's disease 11. Discuss adrenal medullary hormones and their disorders 12. Discuss the synthesis and control of insulin and glucagon 13. Discuss effect of insulin on body metabolism 14. Elaborate different types of diabetes mellitus 15. Discuss different hormones for the regulation of calcium homeostasis 16. Role of vitamin D in osteoporosis and osteomalacia 17. Discuss male reproductive physiology 18. Discuss female reproductive Physiology 19. Discuss physiology of lactation 20. Discuss hormonal and physical changes during pregnancy 21. Discuss cell division and implantation following fertilization 										
Course learning outcomes (CLOs)	<p>At the end of this course, students should be able to identify:</p> <ol style="list-style-type: none"> 1. Classification and mechanism of action of hormones 2. synthesis ,secretion ,mechanism of action and disorders of different hormones 3. Spermatogenesis, oogenesis and fertilization,implantation and conception 4. Physiological changes during pregnancy 5. Synthesis and production of milk 										
Course Outline	<ol style="list-style-type: none"> 1.classification of hormones 2. Physiological mechanisms and functions of different hormones . 3. Physiology of pregnancy and lactation 										
Resources	<p>Recommended Books : Latest Edition of all mentioned books should be referred)</p> <ol style="list-style-type: none"> 1.Guyton and Hall Text book of Physiology 2.Review of Medical Physiology by W. F. Ganong 3.Human Physiology by Lauralee Sherwood 4.Human physiology by Rhoades 5.Greenspan's basic and clinical Endocrinology by David Gardner 										
Sixteen Weeks Plan	<p>WEEK No COURSE CONTENT</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Week 1</td><td>Classification and mechanism of action of hormones</td></tr> <tr> <td>Week 2</td><td>Anterior pituitary hormones</td></tr> <tr> <td>Week 3.</td><td>Growth hormone.QUIZ-1</td></tr> <tr> <td>Week 4.</td><td>Tropic and non-tropic hormones. ASSIGNMENT- 1</td></tr> <tr> <td>Week 5.</td><td>Posterior pituitary hormones</td></tr> </table>	Week 1	Classification and mechanism of action of hormones	Week 2	Anterior pituitary hormones	Week 3.	Growth hormone. QUIZ-1	Week 4.	Tropic and non-tropic hormones. ASSIGNMENT- 1	Week 5.	Posterior pituitary hormones
Week 1	Classification and mechanism of action of hormones										
Week 2	Anterior pituitary hormones										
Week 3.	Growth hormone. QUIZ-1										
Week 4.	Tropic and non-tropic hormones. ASSIGNMENT- 1										
Week 5.	Posterior pituitary hormones										

	Week 6. Role of ADH in body fluid regulation. QUIZ- 2 Week 7. Thyroid hormones Week 8 Disorders of thyroid hormones Week 9 Mid-term Exam Week 10 Adrenal cortical hormones Week 11 Adrenal medullary hormones Week 12 Graves' disease and Myxedema. QUIZ-3 Week 13 Disorders of adrenal cortical hormones. ASSIGNMENT-2 Week 14 Pancreatic hormones and their disorders Week 15 Diabetes mellitus. QUIZ- 4 Week 16 Male and female reproductive physiology Week 17 Pregnancy and lactation Week 18 Semester Exam
Up dated by:	Prof. Dr.Nighat Rukhsana & Prof .Dr .Shazia Shakoor
Updated on:	18 th January 2020

Electrophysiology	
Course code	PHY 768
Credit hours	3(1+2)
Pre requisite	PHY 760 & PHY 761
Objectives	<ol style="list-style-type: none"> 1. <u>Practical Approach for exercise Physiology On CVS</u> : required to investigate cardiovascular effects of exercise . 2. <u>Practical Approachfor exercise Physiology on Respiratory system</u>: required to investigate the effects of exercise on respiratory muscles. 3. <u>Diagnostic Approach</u> : To record compare and analyze bio potentials including ECG, EMG and EEG from human subjects. (cases and controls) 4. Interpretation and Recording of normal ECG in human subject 5. Discuss the types and basis of different normal and abnormal heart sounds 6. Auscultate and interpret heart sounds 7. Discuss mean arterial pressure and its regulation 8. Perform recording of blood pressure by different methods 9. Describe different types of pulses and their characters 10. Perform pulse recording by lab tutor 11. Perform response of cardiovascular system to exercise 12. Compare the significance of EMG and nerve conduction tests in neurological and muscular disorders
Course learning outcomes (CLOs)	<p>At the end of this course, students should be able to:</p> <ul style="list-style-type: none"> • Learn effect of exercise on CVS and respiratory system by using power lab • Compare and analyze biopotential including ECG,EEG and EMG on human subject by power lab and EMG machine • Perform recording of blood pressure, pulse and nerve conduction test in normal , neurological and muscular disorders by using power lab and EMG machine

Course outline	<p>Human Physiology Systems include structural and functional details of :</p> <ol style="list-style-type: none"> Power Lab 15T (two general purpose inputs, human approved Dual Bio Amp, low voltage Stimulator and human approved Isolated Stimulator) Lab Tutor Teaching Suite software Pulse Transducer ,5 Lead Shielded Bio Amp CableShielded Lead Wires (5 snap-on)Stimulating Bar ElectrodeSphygmomanometerRespiratory Belt TransducerGrip Force TransducerCardio Microphone ,Push Button Switch EEG Flat Electrodes ,Dry Earth StrapReusable ECG ElectrodesDisposable ECG Electrodes (100 pack) Abrasive Gel Electrode CreamElectrodePasteAlcoholSwabsTeaching System Case Human Physiology System II with Human Respiratory Kit with gel
Resources	<p><u>Recommended Books:</u></p> <ol style="list-style-type: none"> The Spark of Life: Electricity in the Human Body Book by Frances Ashcroft. A practical guide line for invasive EPs. Hand book of cardiac electrophysiology 2007-2010 A practical guideline of electrophysiology through case studies Manual of Power lab by Francis D.M ,2012 <p>Website : www.sajs.co.za/spark-life-electricity-human-body</p>
Sixteen Week Plan	<p>Week No: Course Content</p> <p>Week 1 Practical Approach for exercise Physiology On CVS Week 2 Practical Approach for exercise Physiology on Respiratory system</p> <p>Week 3 Bio electrical potentials.QUIZ-1</p> <p>Week 4 Diagnostic Approach: To record compare and analyze bio potentials. ASSIGNMENT -1</p> <p>Week 5 Research USE :Human Physiology System II includes the Human Respiratory Kit</p> <p>Week 6 Recording and comparison of bio potentials including ECG, EMG and EEG from human subjects. QUIZ - 2</p> <p>Week 7 Power lab Interpretation of Nerve and muscle physiological and pathophysiological events</p> <p>Week 8 ECG</p> <p>Week 9 Mid- Term Exam</p> <p>Week 10 Blood pressure</p> <p>Week 11 Pulse recording</p> <p>Week 12 Interpretation of cardiac arrhythmias by ECG. QUIZ - 3</p> <p>Week 13 Significance of vitalograph in assessment of pulmonary function tests. ASSIGNMENT - 2</p> <p>Week 14 Electromyography (EMG)</p> <p>Week 15 Nerve conduction studies QUIZ - 4</p> <p>Week 16 Electroencephalogram.</p> <p>Week 17 Discussion and Presentation</p> <p>Week 18 Semester Exam</p>
Prepared by	Prof Dr. Nighat Rukhsana & Prof .Dr .Shazia Shakoor
Updated On	18 th January 2020

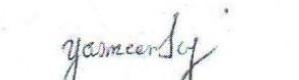
BAHRIA UNIVERSITY MEDICAL & DENTAL COLLEGE
MPhil PROGRAMS MARKS DISTRIBUTION
March 2020

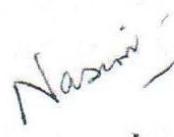
S#	Heads	Theory	Marks break up	Practical	Marks break up
1.	Internal Evaluation	30 Quiz= 04 Assignment=02 Presentation = 01	16 10 04	30	Performance=10 Journal = 10 Critical analysis =10
2.	Mid-term Exam	30 (30 BCQs) (0.5 marks each) (03 SEQs) (05 marks each)	BCQs= 15 SEQs = 15	30 (04 Stat) (05 marks each) (01Stat)	OSPE= 20 Viva = 10
3.	Final- Term Exam	40 (40 BCQs) (0.5 marks each) (04 SEQs) (05 marks each)	BCQs= 20 SEQs = 20	40 (06 Stat) (05 marks each) (01Stat)	OSPE= 30 Viva = 10
	Total	100		100	

*for course with theory only, total marks = 100

*for course with theory & practical (lab.) total marks = 200


 HOD- Anatomy


 HOD-Pathology


 HOD Pharmacology

Appendage 3511**Roadmap MSEE**

Semester-I		
i.	ESC 501	Core – I Research Methodology (University Requirement)
ii.		Core – II
iii.		Core – III
Semester-II		
i.		Core-IV
ii.		Core-V
iii.		Elective-I

Semester-III		
i.		Elective-II
ii.		Thesis-I/ Elective-IV

Semester-IV		
i.		Elective-III
ii.		Thesis-II/ Elective-V

MS EE (Automation and Control)**Core Courses**

Sr.	Course Code	Core Course Title	Credit Hours
1	ESC 501	Research Methodology	3
2	EEN 510	Stochastic Process	3
3	EET 724	Optimization Techniques in Electrical Engineering	3
4	EEA 600	Artificial Intelligence for Control Systems	3
5	EEN 726	Modern Control Theory	3

Elective Courses

Sr.	Course Code	Elective Course Title	Credit Hours
1	EEA 713	Robust Multivariable Control System	3
2	EEA 703	Dynamic Modeling system	3
3	EEA 749	Fuzzy Logic and Intelligent Control Systems	3
4	EEA 509	Nonlinear Control Systems	3
5	EEA 704	Adaptive Control Systems	3
6	CEN 758	Robotics and Intelligent Sensors	3
7	CEN 722	Advanced Interfacing Techniques	3
8	EEA 540	Mechatronics	3
9	EEN 506	Advanced Solid State Devices	3
10	EEA 601	Industrial Automation Technologies	3
11	EEA 602	System Integration	3
12	EEA 715	Industrial Project Management	3
13	EEA 716	Control Instrumentation and Robotics	3
14	EEA 717	Process Control Commissioning and Production Management	3

MS EE (Power Systems)**Core Courses**

Sr.	Course Code	Core Course Title	Credit Hours
1	ESC 501	Research Methodology	3
2	EEN 510	Stochastic Process	3
3	EET 724	Optimization Techniques in Electrical Engineering	3
4	EEP 558	Power Transmission and Distribution	3
5	EEP 559	Power Generation and Plant Operation	3

Elective Courses

Sr.	Course Code	Elective Course Title	Credit Hours
1.	EEP 716	Advanced Power System Analysis	3
2.	EEP 717	Advanced Power System Planning	3
3.	EEP 718	Advanced Power System Protection	3
4.	EEP 561	High Voltage Engineering Design	3
5.	EEP 754	Smart Grid System Operation	3
6.	EEP 521	Design of Electrical Machines	3
7.	EEP 564	Hydel Power Generation	3
8.	EEP 565	Integration of Distributed Generation	3
9.	EEP 566	Power System Reliability	3
10.	EEP 719	Advanced Topics in Power Systems Engineering	3
11.	EEP 514	Renewable Energy	3
12.	EEP 757	Non-Conventional Energy Systems	3
13.	EEP 516	Solar Power Generation	3
14.	EEP 517	Wind Power Generation	3
15.	EEP 519	Hybrid Power Systems	3
16.	EEP 714	Advanced Topics in Renewable Energy	3
17.	EEP 723	Thermal and Nuclear Power Generation	3
18.	EEP 720	Computer Methods in Power Systems	3
19.	EEP 721	Insulation Co-ordination in Power Systems	3
20.	EEP 712	Advanced Power Electronics	3
21.	EEP 502	Advanced Power System Operation and Control	3
22.	EEP 780	EMS & SCADA	3
23.	EEA 713	Robust Multivariable Control System	3
24.	EEA 749	Fuzzy Logic and Intelligent Control Systems	3
25.	EEA 509	Nonlinear Control Systems	3

MS EE (Communication Systems & IoT Networks)

Core Courses

Sr.	Course Code	Core Course Title	Credit Hours
1.	ESC 501	Research Methodology	3
2.	EEN 510	Stochastic Process	3
3.	EET 724	Optimization Techniques in Electrical Engineering	3
4	EEN 712	Advanced Digital Communication Systems	3
5	EET 603	Communication Technologies & Platforms for IoT	3

Elective Courses

Sr.	Course Code	Elective Course Title	Credit Hours
1.	EET 729	Wireless Sensor Networks	3
2.	EET 762	Communication Network Architecture and Protocols	3
3.	EET 766	RF System Engineering and Design	3
4.	EET 750	Antennas Theory, Design and Applications	3
5.	EET 768	Cognitive & software Defined Radio	3
6.	EET 755	Wireless Communication Techniques	3
7.	EEN 740	Embedded System Design for Telecommunications	3
8.	EET 756	Telecommunication Switching Systems	3
9.	EET 702	Advanced Network Security	3
10.	CEN 745	Advanced Digital Image Processing	3
11.	ESC 716	Advanced Topics in Wireless & Networking	3
12.	EEN 725	Advanced Digital Signal Processing	3
13.	EET 560	Telecommunication Network Management	3
14.	EET 555	Wireless & Mobile Communications	3
15.	EET 552	Multimedia Networking	3
16.	EET 553	Information Theory and Coding	3
17.	EET 546	Radio & Microwave Engineering	3
18.	EET 555	Wireless & Mobile Communications	3
19.	EET 558	5G And Internet of Things	3
20.	EET 559	Programming of Internet of Things	3
21.	EET 601	Narrow Band IoT Systems	3
22.	EET 731	IoT for Industry 4.0	3
23.	EET 730	AI for Internet of Things	3
24.	EET 603	SDN for Internet of Things	3
25.	EET 728	Security for Internet of Things	3
26.	EET 602	Ultra-Low Power Radios for IoT	3

Course Description of New Added Core Courses

- **Optimization Techniques in Electrical Engineering (EET 724)**

The purpose of this course is to develop a knowledge in the field of optimization techniques their basic concepts, principles. linear programming and queuing theory in terms of engineering with more specific to electrical engineering.

- **Artificial Intelligence for Control Systems (EEA 600)**

This course equips the students to understand how Artificial Intelligence can help in control systems. AI tools and techniques can aid sensor systems like robotics, cars, and wheelchairs etc. by, making control loops smarter, adaptive, and able to change behavior. The appropriate deployment of new AI tools contribute to the creation of more capable control systems and applications. Systems with continuous dynamics controlled by sequential machines lead to this interdisciplinary area for Control systems are decision-making systems which the industry is moving towards.

- **Communication Technologies & Platforms for IoT (EET 603)**

This course provides with the comprehensive knowledge about key enabling technologies and platforms for Internet of Things. It provides an insight into communication, networks, identification & tracking and service management. This course will also enable the students to gain deep knowledge about different available platforms along with their capabilities & limitations.

Course Description of New Added Elective Core Courses

- **Ultra-Low Power Radios for IoT (EET 602)**

This course aims at elaborating the design of an IoT radio optimized for low-power operation. In depth analysis of Low powered Radios for IoTs is covered with special focus to deployment in dense network.

- **SDN for Internet of Things (EET 603)**

This course aims at set foundation of SDN for IoT systems. Different types of SDN architecture and protocols will be a key part of this course.

- **Security for Internet of Things (EET 728)**

This course aims at building the necessary background and foundation about security model, protocol and assessment procedures for IoT systems. Different types of attacks, regulation standards and privacy assessment procedures will also be the key part of this course.

- **IoT for Industry 4.0 (EET 731)**

The objective of the course, is to provide an introduction to Industry 4.0, Internet of Things (IoT) and related topics. The course is designed to show the convergence between consumer and industrial applications, evolution of connectivity technologies and data processing. Students will be introduced to technological and business challenges and opportunities as well as ethical concerns related to IoT.

- **Programming of Internet of Things (EET 559)**

This course aims at introduce programming aspect of IoT devices and systems. Algorithms governing the deployment and connectivity shall be the main focus

- **Narrow Band IoT Systems (EET 601)**

This course provides with the comprehensive knowledge about narrow band IoT along with their architecture and enabling technologies. It also covers latency, mobility and energy aspects of this novel communication paradigm.

- **AI for Internet of Things (EET 730)**

The course aims to familiarize students with the fundamentals of Internet of Things and Artificial Intelligence so that they are able to design and analyze new solutions for the wide range of AI based industrial IoT applications.

- **5G And Internet of Things (EET 558)**

This course aims at building the necessary background and foundation about communication in 5G and IoTs. Basic communication concepts covering architecture, PHY and MAC layer protocols along with enabling technologies (i.e., short and long distance communication) are the essential part of this course. Some advance applications for the merger of IoTs and 5G is also covered.

- **Industrial Automation Technologies (EEA 601)**

The course covers study of the applications of industrial automation systems, including identification of system requirements, equipment integration, motors, controllers, and sensors. Coverage of set-up, maintenance, and testing of the automated system

- **System Integration (EEA 602)**

This course studies the process of integrating different systems and software applications by examining current and emerging trends, strategies, and techniques for developing systems integration solutions effectively. Example topics covered include, but are not limited to: documenting integration requirements using business process models, designing integration solutions reusing patterns, and implementing integration solutions using service oriented architecture.

- **Industrial Project Management (EEA 715)**

This course accounts for and explain theories and tools used in the field of project management, different types of projects and their characteristics, assess appropriate planning and coordination methodology in relation to the project's scope and type, analyses projects and project execution from the perspective of different stakeholders within the focal organization as well as external stakeholders from other parts of society.

- **Wireless Sensor Networks (EET 729)**

This course provides with the comprehensive knowledge about wireless sensor networks. It provides an insight into different layers and their design considerations. A thorough knowledge of infrastructure establishment and sensor network platform is provided.

- **Control Instrumentation and Robotics (EEA 716)**

The course covers Novel actuator and sensor technology, bio-robotics and bioinstrumentation, control of complex systems, precision instrumentation, autonomous robotic vehicle, and optics.

- **Process Control Commissioning and Production management (EEA 717)**

This course covers the function of basic devices for measuring and controlling different kinds of variables in process control. Introduces closed-loop control and PID functions. Introduces maintenance of analog and digital devices and programmable logic controllers (PLCs). ISA and SAMA instrumentation symbols and interpretation and use of process diagrams are covered. In the second part covers the Production and Operations Management would be given which would include decision-making, capacity planning, aggregate planning, forecasting, and inventory management, distribution planning, materials requirements planning (MRP), project management and quality control.

Modification in Eligibility Criterion for BS (IT) & BS (CS) Programs**New Proposed Policy****Eligibility Criteria:**

Minimum 50% marks in Intermediate (HSSC) Examination (Pre-Medical/Pre-Engg.) or equivalent qualification with Mathematics certified by IBCC.

Deficiency Courses:

For Pre-Medical students, the following two deficiency courses of 3 credit hours will be taught.

Fundamentals of Mathematics I GSC 103 (3 Credit Hours)

- Number System, Sets, Functions and Groups, Matrices and Determinants, Quadratic Equations, Partial Fractions, Sequences and Series, Permutation, Combination and Probability, Mathematical Induction and Binomial Theorem, Fundamentals of Trigonometry, Trigonometric Identities, Trigonometric Functions and their Graphs, Application of Trigonometry, Inverse Trigonometric Functions, Solutions of Trigonometric Equation

Fundamentals of Mathematics II GSC 104 (3 Credit Hours)

- Functions and Limits, Differentiation, Integration, Introduction to Analytic Geometry, Linear Inequalities and Linear Programming, Conic Section, Vectors

Course Registration

1. Students with Pre-medical background must furnish an **undertaking** that they must pass deficiency courses of Mathematics of 6 credit hours within one year of their regular studies. Failure to do so will result in cancellation of admission without any fee refund. The scheme for registration in deficiency courses shall be as under:
2. Student will cover deficiency course (as an additional load) in their regular semester. One option is they will opt for Fundamentals of Mathematics I in first semester and Fundamentals of Mathematics II in second semester. Furthermore, both these deficiency courses have no prerequisites i.e. both can be registered together as well. Deficiency courses may also be allowed to be registered as new courses in Summer Semester.
3. The student shall pay deficiency courses fee as per undergraduate program fee structure.
4. The deficiency courses shall be recorded on transcript as PASS / FAIL. The passing marks for the deficiency courses shall be as per BU undergraduate rules.
5. The deficiency course(s) shall not be included in CGPA calculations of the degree program.
6. The UG general/semester rules shall be applicable to these student including registration, maximum course load, attendance, examinations, medal and awards etc.

Changes in Elective Courses of BSE Program

Background

Revision of curriculum and addition of new courses and labs is a continuous process. During the last PEC visit at BUKC, one of the members recommended that Cloud Computing course should have a lab component. Moreover, there were recommendations by CAC members to add lab component to various courses of BSE program to meet industrial requirements.

Recommendation

After thorough discussion at DBOS, CAC and FBOS, following changes in the curriculum of BSE are recommended.

Changes in Elective Courses of BSE Program

1. Addition of Lab Component/Newly Assigned Course Code

S #	Existing Course Name	Elective Course Category	Change Status	Remarks
1	Course Code: CSC 487 Course Title: Introduction to Data Science Credit Hour: (3+0) Status: Part of existing curriculum	SE Elective course	Course Code: CSC 495 Course Title: Introduction to Data Science Credit Hours: (2+1) Pre-requisite: Course Code: CSC 220 Course Title: Database Management Systems	CSC 495 is already approved in CS roadmap (31 st ACM as per Unified Course Codes Book)
2	Course Code: SEN-334 Course Title: Object oriented Software Engineering Credit Hour: (3+1) Status: Not part of existing curriculum	SE Elective course	Addition and Re-introduction of the course in the roadmap as: Course Code: SEN 335 Course Title: Object Oriented Software Engineering Credit Hour: (2+1)	The course was removed from the core courses in Fall 2018 course, however, it was part of core courses in the Fall 2016 roadmap.
3	Course Code: SEN-325 Course Title: Cloud Computing Credit Hour: (3+0)	SE Elective Course	Re-introduction of the course in the roadmap as: Course Code: SEN 401	

	Status: Part of existing curriculum		Course Title: Cloud Computing Credit Hour: (2+1)	
--	--	--	---	--

SEN 335 Object Oriented Software Engineering (2+1)

Pre-requisite: CSC 210 Object Oriented Programming

Course Description:

This course gives introduction to object oriented software engineering, processes and models, object oriented analysis and design concepts, modeling with UML, project organization and communication, addressing design goals, object design, design and code reusability through design patterns and idioms, refactoring, configuration management, project management

SEN 401 Cloud Computing (2+1)

Pre-requisite: None

Course Description:

The course gives introduction to cloud computing and cover the topics of cloud infrastructures, virtualization, software defined networks and storage, cloud storage, and programming models, the motivating factors, benefits and challenges of the cloud, as well as service models, service level agreements (SLAs), security, example cloud service providers and use cases.

Revision of Program Educational Objectives PEOs of BSE Program

The following revised PEOs along with their relevant mapping are suggested.

Existing	Revision
Graduates should demonstrate competence to apply Software Engineering knowledge & practices in various phases of software/system development life cycle in their respective professional career.	Graduates should demonstrate competence in applying Software Engineering principles & practices in various phases of software/system development life cycle in their respective professional career.
Graduates should demonstrate an ability to work as a member and/or leader in a team with a strong sense of societal context, professional ethics and effective communication skills in professional practice.	Graduates should demonstrate effective team member or leadership skills with strong managerial skills and a sound sense of social responsibility for the sustainable development of society.
Graduates should demonstrate sustained learning by pursuing life-long learning through graduate studies, professional development or managerial/leadership skills.	Graduates should demonstrate sustained career development and progression through ethical engineering practices, effective communication skills and continuous learning.

Revised PEO to PLO Mapping

Program Learning Outcomes (PLOs)	Program Educational Objectives (PEOs)		
	1	2	3
PLO 1: Engineering Knowledge	✓		
PLO 2: Problem Analysis	✓		
PLO 3: Design/Development of Solutions	✓		
PLO 4: Investigation	✓		
PLO 5: Modern Tool Usage	✓		
PLO 6: The Engineer and Society		✓	
PLO 7: Environment and Sustainability		✓	
PLO 8: Ethics			✓
PLO 9: Individual and Team Work		✓	
PLO 10: Communication			✓
PLO 11: Project Management		✓	✓

PLO 12: Lifelong Learning			✓
---------------------------	--	--	---

Mapping of PEOs with University Vision & Mission

Vision & Mission	Program Educational Objectives (PEOs)		
	PEO 1	PEO 2	PEO 3
University Vision To become a knowledge and creativity driven international university that contributes towards development of society.	✓	✓	✓
University Mission To ensure academic excellence through deliverance of quality education and applied research in a collegiate environment having strong linkages with industry and international community to meet the societal challenges.	✓	✓	✓
Department's Vision Department of Software Engineering aims to be recognized as a leader in Software Engineering education and research through excellence in modern education and targeted research in emerging areas of Software Engineering.	✓	✓	✓
Program Mission The mission of Bachelor of Software Engineering program is to prepare technically strong Software Engineers who can contribute effectively towards the nation, society and the world at large through effective problem solving skills, application of engineering knowledge, leadership and healthy lifelong learning attitude.	✓	✓	✓

Appendage 3516**BACHELOR OF SCIENCE IN GEOSCIENCES (BS-Geosciences)**

With Specializations: Marine Geology; Marine Geophysics; GIS & Remote Sensing

INTRODUCTION

Geoscience is the study of the Earth - its oceans, atmosphere, rivers & lakes, ice sheets & glaciers, soils & its complex surfaces, rock & their interior metallic cores. It further involves to study various aspects of how living things, including humans, interact with the Earth & its resources. Geoscience uses tools and practices of its own but it is intimately linked with the biological, chemical, and physical sciences, as well. It helps to study both terrestrial & marine resources and their ecology. Hence, it includes disciplines of Geology, Geomorphology; Geochemistry; Geophysics; Geo-environment; Coastal & marine Geology, Marine Geophysics, Marine Ecology etc. It also uses techniques of GIS & Remote Sensing and modern applications of artificial intelligence (AI) for natural resource explorations, i.e., oil, gas, mineral, water etc.

The Geoscientists use the knowledge of physical, chemical, biological sciences besides mathematics, economics and exploration engineering, to build a quantitative understanding of the Earth systems and processes, in order to explore natural resources in oceans and land, equitably. A geoscientist is a trained professional whose main tasks are: to explore earth resources by sampling through the operation of geological equipment & instruments; to design appropriate fieldwork to explore; to collect geo-spatial data; to conduct estimation analysis & processing of data; and would also conduct research and development (R&D) activities with focus on environmental protection and sustainable resource management practices.

The curriculum and research assignments of geoscience graduates are diversified, which enables them to adopt professions directly related to their degree around the world. Many Private companies and well-known Governmental enterprises hire graduates for the exploration and production, hydrogeological studies and water supply projects, environmental engineering, and geological surveying. Hence, geoscience graduate possesses a better scope of job placement in governmental, educational, and research-oriented job profiles as coastal geologist; Surveyor; Soil scientist; Remote sensing specialist; Groundwater specialist; Mining or marine engineer; Environmental scientist; Marine Geologist; Petroleum Engineer; Seismologists; Geo-software developers; Geochemist; Geophysicist; Oceanographer; Environmental consultant; and Environmental lawyers etc. Moreover, a degree in geosciences is well-accepted in leading institutions of the world, and subsequently, BU graduates in geosciences may explore more academic programs for higher studies in various parts of the world to pursue higher studies.

OBJECTIVES OF THE PROGRAM

Geosciences is an applied science where specialized geoscientists apply scientific methods and formulate hypothesis after gathering data about the natural resources and then test their hypothesis by application of exploration techniques. Currently, *in the age of increasing energy demand with decrease in energy resources; need of minerals and water resources, and growing environmental concerns, the human society is facing multi-dimensional challenges. It is imperative that knowledge of diversified fields of geosciences is well utilized in several exploration and surveying projects with sustainable development. Geosciences is an art as well as science with intellectual thinking and adventurism in both terrestrial and marine environments. Hence, the objectives of studying Geoscience are:*

- To introduce modern techniques of applied science used in the exploration of natural resources in terrestrial as well as in offshore environments.
- To equip the students with critical analysis in quantifying the economic resources such as minerals, oil/gas, coal, and groundwater, etc.
- To enable the students to integrate allied disciplines: Geology, Geophysics, Environmental Sciences, Earthquake Seismology, GIS & Remote Sensing.
- To adopt holistic approach towards exploitation of natural resources for their contribution to national economy.
- To foster effective oral written and interpersonal skills with ethical values.

LEARNING OUTCOME OF THE PROGRAM

Geosciences has created enhanced career opportunities for geologists, environmentalists, geophysicists, seismologists, etc. to work for society's demands for natural resources while maintaining sustainable Earth's natural environments. After completion of the degree program in Geosciences, the students will be able:

- to apply knowledge of Geosciences with integrated research approach in natural resource exploration activities.
- to utilize emerging techniques, skills, and tools necessary to study geosciences.
- to communicate effectively regarding geoscience with excellent written and oral skills with maximum ethical values.
- to work effectively in groups/team environment to accomplish a common goal for national development
- to pursue continuous professional development and higher studies and enhance capabilities as an individual and for the mankind.

RATIONALE & FEASIBILITY

1. *Current Scenario & Perspective:* In order to cater upcoming geological explorations under CPEC projects, the current educational environment of Southern Pakistan in general, and Karachi-Makran coastal belt in particular, requires development of human resource in different domains of earth & environmental sciences. Such projects will require distinctly trained human resource (HR) for off-shore as well as terrestrial explorations of natural resources. Furthermore, amply trained professional in an ever-expended ecosystem will find employment opportunities and professional growth in Earth & Environmental Sciences, in both public and private sector enterprises. In Southern Sindh, University of Karachi is the only Institution that offers undergraduate and graduate degree programs in Geology and Marine Biology under separate departments, with a limited number of seats. With focus on blue economy's paradigm, it is postulated that new curriculum with combination of geosciences and marine related courses and augmented with hands-on experience in exploration techniques with GIS training, will be able to produce graduates with multi-dimensional approach.

2. *Program & its Make-up:* The new Program BS-Geoscience has been deliberated with focus on broadening the scope of existing geophysics program at E&ES-BUKC. The program will cover all aspects of Geological sciences during preparatory semesters I-VI. Consequent upon completion, the program will offer additional specialized courses in one of the 3-domains of choice, i.e., marine Geology, marine geophysics and GIS/RS during last academic Year (Semester VII-VIII).

3. *Existing Resources:* The existing faculty members, with diverse training and expertise in different domains of geological sciences, are already facilitating Geophysics, GIS and Geological Science courses at E&ES-BUKC, hence there will be no immediate requirement of additional faculty members until the intake reaches to semester-VII (Year 2023-24). Besides that, Faculty at the *School of Maritime Studies & Aquatic Diagnostic Lab* (ADL) with Marine & Coastal Biology expertise are also available to serve as additional resource to new program, where required. Furthermore, the laboratory facilities, equipment and personnel available will further suffice the training requirements of the new program without any additional cost.

4. *Global Programs:* BS-Geoscience Program is offered worldwide and some examples include author's *alma mater* Louisiana State University, USA, a Gulf of Mexico Coastal State that houses a School of Coastal & Environmental Studies & Geo-Science complex. Similar programs are offered in other United States and globally, that include: Texas A&M-USA with Coastal & Marine Geology; Colorado State University-Fort Collins; University of Texas at Austin; University of Massachusetts-Amherest; University of California, Rice University at Houston Texas; University of Utah-USA; University of Breman -Germany; Wolfgang Goethe University, Frankfurt; University of Munich-Germany; University of New England-NSW-Australia; William & Merry, University of Virginia-USA; McGill University-Canada; University of Alberta-Canada; to name a few. Other globally renowned institutions that offer MS/PhD Programs with specializations according to their Geography include:

- a. <https://clas.uiowa.edu/ees/undergraduate-program/bs-geoscience>
- b. <https://www.boisestate.edu/earth/degrees/geosciences/>
- c. <https://catalog.uaf.edu/bachelors/bachelors-degree-programs/geoscience/bs/>
- d. <https://www.tarleton.edu/degrees/bachelors/bs-geoscience/index.html> (Texas A&M System)
- e. https://earth.utah.edu/current_students_undergraduate/bs-geoscience.php (University of Utah)
- f. <https://uwm.edu/geosciences/undergraduate/bs-degree/Milwaukee>
- g. <https://www.une.edu.au> (Australia)
- h. https://my.uq.edu.au/programs-courses/plan.html?acad_plan=geolsx2030 (Queensland)
- i. <https://www.tamug.edu/mars/degrees/> (Texax A&M at Gelveston) (Coastal & Marine Geology)

5. *Tapping Blue Economy benefits:* Most of the Coastal & Marine and CPEC-related upcoming projects are aimed at harvesting the benefits based on Blue Economy paradigm. It will require extensively trained human resource in both on-shore & off-shore related courses and projects. Both public and private sectors will employ graduates that possess diverse knowledge and training in coastal and marine environment; off-shore geology and geophysical explorations; marine environment & its sustainable development that are required for off-shore Oil & Gas Exploration Studies. Recently, the faculty members of E&ES have received training and know-how about Off-shore geography and exploration techniques in China with sponsorship of Chinese Geological Society (CGS). Besides that Existing oil & gas industry & public-sector

organizations, i.e., PPL, LMKR, OGDCL, SUPARCO, Met. Dept. & Ministry of Maritime etc., have also participated and accepting Interns for future employment. Such international & national organizations have been focusing on increasing exploration activities in EEZ along Karachi & coastal belt of Balochistan. Moreover, groundwork for excavation/exploration of coastal & off-shore natural resources, is under progress, and trained HR will be needed in near future. With consolidated program offering much needed basic geological science courses along with marine environment related courses, it will cater the need of both coastal and marine related job market in upcoming CPEC-OBOR related activities in coastal belt of Pakistan, but will also in both on-shore & off-shore economic activity based on BLUE ECONOMY paradigm.

ELIGIBILITY CRITERIA

Program	Eligibility Requirements
(Karachi only) BS Geosciences with Specialization in <ul style="list-style-type: none"> • Marine Geophysics • Marine Geology • GIS and Remote Sensing 	<ul style="list-style-type: none"> - F.Sc. (Pre-Engg/Pre-Medical /A-levels/ICS (Second Division or 45% marks) - Associate Engg. Diploma (Polytech) with Equivalent of 45% marks. - BU Entry test & Interview

ROAD MAP OF BS - GEOSCIENCES PROGRAM

YEAR-1

Semester I

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs
PAK 101	Pakistan studies	2	2
ISL 101	Islamic Studies	2	2
ENG 103	English I	3	3
GEO 101	Introduction to Geosciences	2+1	3
MAT 105	Mathematics (for pre-med.)	0	3
CSC 105	Introduction to Computers	2+1	3
PHY 101	Physics	2+1	3
Total	16		16

Semester II

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
ENG 104	English II	3	3
GEO 110	Fundamentals of Geography & Geomorphology	3	3
GEO 115	Introduction To Geophysics	3	3
GEO 120	Field Geology	2+1	3
MAT 115	Calculus & Analytical Geometry	3	3
CHM 105	Chemistry	2+1	3
Total		18	18

YEAR-2**Semester III**

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
ENG 232	Oral Communication	3	3
GEO 205	Structural Geology	2+1	3
GEO 210	Mineralogy & Crystallography	2+1	3
CSC 205	Programming Fundamentals	2+1	3
ENV 245	Introduction to Oceanography	3	3
	One of The Following:		
HSS 107	Introduction to Psychology		
HSS 111	Introduction to IR		
HSS 115	Introduction to Media Studies		
HSS 201	Introduction to Anthropology		
HSS 202	Introduction to Sociology		
Total		18	18

Semester IV

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
GEO 215	Sedimentology	3	3
MAT 205	Statistics	2+1	3
GEO 225	Geochemistry	2+1	3
GEO 230	Geo-tectonics	3	3
	One of The Following:		
HSS 107	Introduction to Psychology		
HSS 111	Introduction to IR		
HSS 115	Introduction to Media Studies	3	3
HSS 201	Introduction to Anthropology		
HSS 202	Introduction to Sociology		
Total		15	15

Field Work - I

GEO 280	Geosciences Field Work and Report-I	0+2	2
---------	-------------------------------------	-----	---

YEAR-3**Semester V**

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
GEO 305	Environmental Geology	2+1	3
GEO 302	Geophysical Exploration Methods	2+1	3
GEO 315	Igneous & Metamorphic Petrology	2+1	3
GEO 350	Geology of Pakistan	3	3
GEO 437	GIS & Remote Sensing	2+1	3
GEO 325	Stratigraphy of Pakistan	3	3
Total		18	18

Semester VI

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
GEO 320	Marine Geology	2+1	3
GEO 335	Earthquake Seismology	2+1	3
GEO 410	Engineering Geology	2+1	3
GEO 345	Petroleum Geology	3	3
GEO 425	Research Methodology	2	2
Total		14	14

Field Work - II

GEO 380	Geosciences Field Work and Report II	0+2	2
---------	--------------------------------------	-----	---

YEAR-4 (Specialization Year)* ****Semester VII**

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
GEO XXX	Specialize Course - I	2+1	3
GEO XXX	Specialize Course - II	2+1	3
GEO XXX	Specialize Course - III	2+1	3
GEO XXX	Specialize Course - IV	2+1	3
GEO XXX	Specialize Course - V	2+1	3
Total		15	15

Field Work-III

GEO 480	Geosciences Field Work and Report III	0+2	2
---------	---------------------------------------	-----	---

Semester VIII

Course Code	Course Title	Credit hours (T&L)	Total Credit Hrs.
GEO XXX	Specialize Course - VI	2+1	3
GEO XXX	Specialize Course - VII	2+1	3
ENV 425	Occupational Health & Safety	3+0	3
GEO 490	Thesis	0+6	6
Total		15	15
Grand Total		135 CH	

* All Courses in the Specialization will be offered during Year-IV (semester VII-VIII) and will be of 400s Level

** The courses under Specialization mentioned as GEO XXX (above) will be picked up from listed courses given below, accordingly.

SPECIALIZATION COURSES

- The following 3-Specializations/choices , i.e., Marine Geology; Marine Geophysics; & GIS & Remote Sensing, will be offered to students at Semester-VII, to choose from. The list of courses for each specialization is listed below:

	Marine Geology	Marine Geophysics	GIS & RS
1	GEO 461 - Coastal Geology & Geomorphology	GEO 461 - Coastal Geology & Geomorphology	GEO 481- GIS Database Management
2	GEO 462 - Physical Oceanography & Surveying	GEO 475 - Seismic Data Interpretation	GEO 482 - Satellite Image Processing
3	GEO 463 - Ocean Crust Sedimentation	GEO 463 - Ocean Crust Sedimentation	GEO 483 - GIS Data Analysis

4	GEO 445- Seismic Stratigraphy	GEO 445 - Seismic Stratigraphy	GEO 484 - Cartography & Mapping
5	GEO 415 - Economic Geology	GEO 441 – Applied Borehole Geophysics	GEO 485 - GIS Surveying & GPS Tech.
6	GEO 420 - Hydrogeology	GEO 420 - Hydrogeology	GEO 486 - Mapping of Natural Resources
7	GEO 444 - Applied GIS & RS Techniques		

DETAILS OF COURSE CONTENTS

A. UNIVERSITY COURSE REQUIREMENTS: (22 Credit Hrs.)

ENG 103 - ENGLISH-I (3 CH)

Process of Comprehension; Understanding and segmentation of important information; Importance and Principles of Comprehension; Passage, Paragraph; extracting required and relevant information; Direct & Indirect approaches; Introduction to speech analysis; Comprehension of speech; Speaking correct English; Oral Communication / Practice; Listening Techniques; Taking and giving instructions orally / written and by telephone; Direct / Indirect Speech; Idioms / Synonyms; Communication through Visual Aids; Demonstrations / Presentations.

ENG 104 - ENGLISH-II (3 CH)

Pre-requisite: ENG 103

Report writing, letter writing (formal), précis writing (advance), listening skill (advance), reading skills (advance), essay writing, story writing, curriculum vitae/résumé writing, vocabulary (advance), and presentations.

ENG 232 - ORAL COMMUNICATION (3 CH)

Pre-requisite: ENG 104

Introduction to Oral Communication, Confidence Building/Knowing your Audience, Public Speaking & Presentation Skills, Meeting & Interviewing Skills, Non Verbal Communication, Listening & Communication, Project Reviewing (Recording an interview), Arguing a Point of View.

ISL-101 ISLAMIC STUDIES (2CH)

Introduction to Quranic Studies, Study of selected Text of Holly Quran, Study of Selected Text of Holy Quran, Steerat of Holy Prophet (S.A.W) I, Seerat of Holy Prophet (S.A.W) II, Introduction To Sunnah, Selected Study from Text of Hadith, Introduction to Islamic Law & Jurisprudence, Islam Culture & Civilization, Islam & Science, Islam Economic System, Political System of Islam, Islam History, Social values.

PAK 101 - PAKISTAN STUDIES (2CH)

Historical Perspective, Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quad-e-Azam Muhammad Ali Jinnah. Factors leading to Muslim separatism, People and Land, 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.

MAT 105 MATHEMATICS (0 CH) For Pre-Med Students

Number System: Real Numbers; Properties of Real Numbers; Complex Numbers and related laws of addition, multiplication and division; Functions Domain & Range; Inverse of a Function; Quadratic equations and their solutions; Matrices and Determinants; Partial Fractions; Sequences and Series; Permutations and Combinations; Mathematical Induction and Binomial Theorem; Basics of Vector Analysis; Elementary Coordinate Geometry; Limits and Continuity of Functions; Differentiation and Integration of Functions

MAT 115 - CALCULUS & ANALYTICAL GEOMETRY (3 CH)

Limit of a function and theorems on limits; Calculating limits using limit theorems; One-sided limits. Limits at infinity; Infinite limits; Continuity of functions and theorems on Continuity; The Intermediate Value of theorem; Differentiation rules; Derivatives of algebraic and transcendental functions Derivative of Composite functions (The chain rule); Implicit differentiation; Higher derivatives; Differentials and errors; Integral and derivative; Rules for indefinite integration; Integration by substitution, by Parts and by Partial Fractions; Trigonometric integrals and trigonometric substitutions; Definite integrals Application to arc length and area between curves; Sequences; Limit of a sequence; Infinite series; Convergent and divergent series; Test for convergence; Power Series; Taylor and Maclovin Series; Review of Analytic Geometry (Line, Circle, Conic Sections).

MAT 205 - STATISTICS (3 CH)

Pre-Requisite: MAT 115

Collection and Interpretation of Data; Data array and frequency distribution; Measure of Central tendency: Mean (all types), Median, Mode; Measure of Dispersion: Mean deviation, standard deviation, variance and skewness; Introduction to probability; Probability distribution; Curve fitting and Regression Analysis; Sampling and Sampling distribution; Estimation of parameters: Point and interval estimates in samples; Statistical Inference; Testing of hypothesis using z, t and f tests.

CSC-105 INTRODUCTION TO COMPUTERS (3 CH)

Objectives & Learning Outcomes: course provide foundation of computers use and its hardware and software. It is aimed to prepare students for future courses where computer and software applications are necessary.

Course Contents:

History of computer development; Application of computers; Classification and types of computers; Basic block diagram of a computer; Hardware (input, output, memory, CPU) and software (system software & application software); Social impact of computer age; Computer in education and scientific research; Introduction to, and history of Internet; Internet service providers and connections; The World Wide Web

B. H&SS COURSES (2 Courses to be selected) (6 Credit Hrs.)

HSS 107 - INTRODUCTION TO PSYCHOLOGY (3 CH)

Understand the vocabulary and concepts of psychology Understand the research upon which the knowledge of human thought and behavior is based Understand how critical thinking skills are developed Be a cautious and analytical consumer of information that is proclaimed to be scientific or based on research Have a greater understanding and accepting of him/her and others Describe the critical developments that led to the present discipline of psychology contrast and compare the three major Describe and apply psychological theory in some areas of his/her life.

HSS 111 - INTRODUCTION TO INTERNATIONAL RELATIONS (3CH)

In this course the students are introduced to basic concepts in international Relations; the development of International Relations as a discipline, its scope, approaches to the study of International Relations; level of analysis and contending theories. Emphasis will be on the examination of contemporary International political systems, global issues of war and peace, economic and political integration, poverty, human rights etc.

HSS 115 - INTRODUCTION TO MEDIA STUDIES (3CH)

In this course the students are introduced to media institutions and methods of production of media messages. It familiarizes the students with the tools of analysis of media messages as well as the studies of the audience and contemporary media debates. The focus then switches from media production and organization, to analysis of media output, to exploration of Consumption and use of this output and ultimately to the larger issue of the socio-political role/s of media in contemporary society.

HSS 201- INTRODUCTION TO ANTHROPOLOGY (3CH)

The course is divided into four segments. Each segment introduces the students to one of the four main branches of Anthropology as a discipline namely socio-cultural anthropology, physical anthropology, archaeology and linguistics. In the first segment the students are introduced to the core concepts within socio-cultural anthropology to include ethnology, ethnography, society,

social organization, culture, sub-culture and counter cultures etc. This segment also introduces the students to ethnographic fieldwork methods and basics of qualitative research. The second segment introduces students to the Darwinian evolutionary theory and theory & practice of paleo-anthropology, forensic anthropology and genetics. The third segment tells the students about the difference between historic, prehistoric and contemporary archaeology. It also familiarizes the students with the methods of conducting archaeological research and provides them with some basic information about various methods of feature and art-factual dating used in archaeology. The fourth and last segment of the course introduces students to various branches of linguistics with a focus on sociolinguistics. It would also discuss issues of politics of representation and discourse analysis.

HSS 202- Introduction to Sociology (3CH)

This course introduces students to the basic concepts of sociology to include the rise, evolution, and functioning of social groups in society, the principles underlying the inter and intra group interaction, the structure of conflict and conflict resolution, articulation between social structures and psychological processes. The course also looks at some of the classical sociological theoreticians to include: Augustine; Xavier; Comte; Herbert Spencer; Emile Durkheim and others.

C. PROGRAM REQUIRED COURSES: (Dept. Prep. & Core Courses = 107 CH)

PHY 101 - PHYSICS (3 CH)

Objectives & Learning outcomes:

This basic physics course provides the foundation for later courses in disciplines of Earth & Environmental sciences. The students will be able to recognize how and when physical methods and principles can help address problems in their major and then apply those methods and principles to solve problems.

Course Contents:

Newton's gravitation law; Kepler laws; Electro statistics; Magnetisms; Amperes law; Magnetic flux density B ; Reflection and refraction Interference and diffraction; Natural and artificial radioactivity; Heat and Conductivity; Pressure and Density; Thermodynamic Principles; Electricity and Magnetism; Semi-Conductor; Transistors; Satellite Communication; Introduction to Meteorology.

Recommended Textbooks & References:

1. "Physics for Scientists and Engineers"- Approach with Modern Physics (2019), 3rd Edition by Randall D. Knight ISBN 10: 0321740904 ISBN 13: 9780321740908

CHM 105 - CHEMISTRY (3 CH)

Objectives and learning outcomes:

Prepare the students with tools of chemistry to apply the concepts and the techniques in their respective discipline.

Course Content:

Periodic Table, Metals, Non—Metals, Concept of Bonding and Its Types, Dielectric Constants, Biochemical Effects of Arsenic, Lead, Mercury, CO, Nitrogen Oxide, SOL Cyanide. Cyclic Pathways in the environment: N, P, COL Pollution and its types, Definition, nature and types of contaminants, Mechanisms and medium for their diffusion, Industrial effluents, agricultural chemicals, fossil fuels, Origin and transmission of pollutants, General study of selected environmental pollutants, Inorganic compounds in soil, Fertilizers, Pesticides and Weedicides as pollutants, Types of Radiation and their biological effects, Water logging and salinity, Buffers and acid base equilibrium, Amino acids, Proteins and enzymes, Techniques for pollution monitoring. Fundamentals of chemistry including macroscopic behavior of basic States of Matter; Energetics of Chemical bonding and its applications; Solutions and colloids; Special emphasis on the acid—base equilibria in aqueous solutions; Buffers and pH; Hydrocarbons; Factors effecting the Chemical reactivity of different organic functional groups; Introduction to molecular spectroscopy and modern analytical techniques with their applications.

Recommended Books & References:

1. Atkins' Physical Chemistry, 11th Edition (2017) by Peter Atkins, Julio de Paula, and James Keeler, Oxford University Press.
2. Andrew Burrows, John Holman, Andrew Parsons, Gwen Pilling, and Gareth Price, (2017) "Chemistry: Introducing inorganic, organic and physical chemistry" 3rd Edition Pearson.

CSC 205 - PROGRAMMING FUNDAMENTALS (3 CH)

Pre-requisite: CSC 105

Objectives & Learning Outcomes:

Prepare students with applications of basic language software's in programing data. After completion, the students will be able to use language skills required in geoscience courses esp. in digital data processing.

Course Contents:

Basic applications of language software's in programing data; Introduction of Program structure of C language; Input & Output functions of C and C + +; Preprocessor directives; Variables and Consonants; Operators; Decision and Loops; Arrays and Pointers. MATLAB.

Recommended Text Books & References:

1. Gilbert Brands (2013) "*Introduction to Computer Science: A Textbook for Beginners in Informatics*". Paperback (2013)
2. David Reed (2019) *A Balanced Introduction to Computer Science (3rd Edition)*
3. Greg Perry's & Dean Miller's (2019) "*C Programming Absolute Beginner's Guide (3rd Edition)*" 2019.

GEO 101 - INTRODUCTION TO GEOSCIENCES (3 CH)

Objectives and learning outcomes:

Students will understand: The theory of plate tectonics explains the large-scale motion of the Earth's lithosphere; theory of plate tectonics is used to interpret the Earth's rock record. Geoscience course graduates will be able to know geologic events using numerical age dating techniques; to understand and explain Earth processes.

Course Content:

Fundamental processes of dynamic earth, exploring their nature and quantitative interactions; Fundamentals composition and structure of the planet earth; geologic events using numerical age dating techniques; formation of mountain ranges, rocks and basins; Earth resources such as Surface and ground water; minerals; energy resources hydrocarbons & geothermal; Geological Eras, Weathering and erosion; Sedimentation; Glaciations, Fossils , volcanism & Environments; theory of plate tectonics; Laboratory exercises in identification of common minerals and rocks; and interpretation of topographic maps; Field trips to nearby geological localities.

Recommended Text books/Reference Books:

1. Grotzinger, J., Jordan, T. H., & Press, F. (2010). *Understanding earth*. Macmillan.
2. King, C. (2008). Geoscience education: an overview. *Studies in Science Education*, 44(2), 187-222.
3. Tarbuck, E. J., Lutgens, F. K., Tasa, D., & Linneman, S. (2005). *Earth: an introduction to physical geology*. Upper Saddle River: Pearson/Prentice Hall.

GEO 110 - FUNDAMENTALS OF GEOGRAPHY AND GEOMORPHOLOGY (3 CH)

Objectives and learning outcomes:

To create an awareness of the geography; characteristics, population distribution and processes affecting contrasting physical and human environments; people interaction with each other and with their environment and understanding of contrasting opportunities and constraints presented by different geographies & environments. It will also create an appreciation of the earth including its people, places, landscapes, natural processes and environment. The students will be able to: acquire the knowledge about basic geographic locations, formation of various landforms on the surface of the earth and will be able to describe the processes by which various types of structures developed on the earth surface due to erosional and depositional processes

Course Content:

The nature and scope of Geography, structure and composition of atmosphere, horizontal and vertical distribution of temperature, air pressure and winds, impacts of lithosphere on human being, role of Hydrosphere on mankind, movements in oceanic water, concept of map making, socio-physical environment of Pakistan, concept of resources and human role. Geomorphological processes, Glaciers and their erosional and depositional land forms. Geological works of wind. Erosional and depositional work of surface and subsurface water, valley and base-level development and its type, drainage pattern, stream meandering and development off flood plains. The erosional and depositional work of sea, development of coastal land forms. Geomorphic cycles and associated landforms produced by tectonics and volcanic activity.

Recommended Text Books/Reference Books:

1. Arbogast, A. F. (2007) Discovering Physical Geography, John Wiley and Sons, London
2. Christopherson, R. W. (2009) Geo systems: An introduction to Physical Geography, Pearson Prentice Hall, New Jersey.
3. De Blij, H. J and Muller, P. O. (1996) Physical Geography of the Global Environment, USA, John Wiley and sons Inc., New Jersey.
4. Fundamentals of Geomorphology 4th Edition by Richard John Huggett
5. Fundamentals of Physical Geography by Richard John Huggett
6. Geomorphology: The Mechanics and Chemistry of Landscapes, Robert S. Anderson, Suzanne P. Anderson, 2010, Cambridge University Press
7. Landscapes and Geomorphology: A Very Short Introduction, Andrew Goudie, Heather Viles, 2010, Oxford University Press.
8. Process Geomorphology by Ritter, Kochel and Miller, 2002, the McGrawHill Company.

GEO 115 - INTRODUCTION TO GEOPHYSICS (3 CH)

PRE-REQUISITE: PHY 101

Objectives and Learning Outcomes:

This course is designed to acquire knowledge about the subsurface geology based on different geophysical methods, with an aim to understand the structure of the earth, exploration of natural resources, and assessment of geohazards.

Course Contents:

Introduction to geophysics and geodynamics of earth. Classification and brief description of various methods of geophysics such as seismic; gravity, magnetic; electrical. Geophysical data acquisition, processing and interpretation; applications of geophysical techniques for exploration of natural resources i.e. oil, gas, metallic minerals, ground water and engineering works. Elementary study of the gravitational, seismic, magnetic, thermal, and radioactive properties of the earth; Methods of measurement, interpretations of data and their applications to the scientific and economic exploration of the earth's interior, ISO stays and Introduction to Paleomagnetism.

Labs: Analysis and interpretation of geophysical data about seismic; gravity, magnetic; electrical, and seismicity.

Recommended Text Books/Reference Books:

1. Whole Earth Geophysics: An Introductory Textbook for Geologists and Geophysicists, Robert J. Lillie, 2008, Prentice Hall.
2. Gravity and Magnetic Exploration: Principal, Practices, and Application, William J. Hinze, Ralph R. B. von Frese, Afif H. Saad, 2013.
3. Tectonics - Recent Advances, 2012, Evgenii Sharkov, InTech.
4. Introduction to Applied Geophysics by Burger R. H., Sheehan, A. and Jones, C. 2000, W. W. Norton
5. Applied Geophysics by Telford, W. M., Geldart, C. P., Sheriff, R. E. and Keys, D. A., 1976, Cambridge University Press.

GEO 120 - FIELD GEOLOGY (3 CH)

Pre-requisite: GEO 101

Objectives and Learning Outcomes:

This course is designed to understand the geological mapping techniques in the field. This will help the students in learning the use of field equipment's and data acquisition and preparation of geological maps and cross-sections.

Course Contents:

Instruments used in field mapping; Introduction to topographic and Geological maps; Methods and techniques of surface and subsurface Geological mapping; Correlation techniques; Field description of igneous, metamorphic and sedimentary rocks; Modes of Geological illustration including structural contour, isopach and lithofacies maps, block and fence diagrams; Field mapping, preparation of Geological maps and cross-section; Field work; Each student is required to do field work and submit a report in the examination; The field work should cover; observation of physical features and their plotting on topographic sheet; Study of geomorphic feature; Measurement of stratigraphic sections; Recognition of structural features; Fauna observation; Study of primary and secondary structures; Field description of sedimentary; igneous and metamorphic rocks.

Recommended Text Books/Reference books:

1. Geological Field Techniques Angela L. Coe (Editor) ISBN: 978-1-444-33062-5 October 2010 Wiley-Blackwell
2. Basic Geological Mapping, 5th Edition Richard J. Lisle, Peter Braham, John W. Barnes ISBN: 978-0-470-68634-8 September 2011

GEO 205 - STRUCTURAL GEOLOGY (3 CH)

Pre-requisite: GEO 110

Objectives and Learning Outcomes:

This course is designed to acquire the knowledge about the pre-and post-deformational structures and their development in the crust. This will help in understanding the mechanics of deformation and types of structures to deal with exploration of natural resources and geohazards assessment.

Course Contents:

Dynamics of rock deformation and mechanical properties of rocks; Stress and strain concepts; Factors controlling mechanical behavior of Materials; Folds classification based on morphology, geometry, and vengeance; Mechanics of fold formation; Faults classification based on geometry and genesis; Structures in compressional and extensional regimes; Classification of Joints, foliations and lineation; Unconformities, their classification and recognition. Laboratory exercises on geologic map interpretation and cross sections; Field trips to area where good Geological structures are exposed

Recommended Text Books/Reference books:

1. Fossen, H. 2010. Structural Geology, Cambridge
2. Davis, G.H. & Reynolds, S.J. 1996. Structural Geology of Rocks and Regions, Wiley
3. McClay, K., 1997. Mapping of Geological Structures, Open University Press.

4. Structural Geology of Rocks and Regions, George H. Davis, Stephen J. Reynolds, Charles F. Kluth, 2011, John Wiley and Sons.
5. Structural Geology, Haakon Fossen 2010, Cambridge University Press.
6. Structural Geology: An Introduction to Geometrical Techniques, Donal M. Ragan, 2009, Cambridge University Press.
7. Foundation of Structural Geology by Park, R. G., 1983, Blackie. 5. Structural Geology of Rocks and Regions by Davis, G. H. and Reynolds, S. J., 1996, John Wiley and Sons.

GEO 210 - MINERALOGY & CRYSTALLOGRAPHY (3 CH)

Pre-requisite: GEO 110

Objectives and Learning Outcomes:

To introduce identification, classification and interpretation of the occurrence of rock-forming minerals and rocks and to provide the essentials of crystallographic theory; and practice sufficient underlying structure of minerals; and, to relate the occurrence of various rock types to current plate tectonic theory. After completion students should be able to: Effectively express themselves in written and oral form on topics dealing with Earth materials. Demonstrate the ability to think critically about Earth material issues through either writing or discussion.

Course Contents:

Minerals; Significance of Minerals in modern world; Classification and system study of minerals with an emphasis on their crystallographic features, physical properties, Chemical composition, occurrences, associations and uses; Identification of common rock-forming minerals; Introduction to Crystallography; elements of symmetry, symmetry operations, crystal notation, crystal systems study of normal classes of crystallographic systems; formation environment of a silicate mineral Introduction to X-ray crystallography Lab: Identification and description of common minerals. Study of crystal models; Petrology of rock within their fundamental plate tectonic context. Plotting crystal faces on a stereo projection.

Lab: Identify common rock-forming minerals in hand specimen and in thin section using diagnostic physical, optical, and chemical properties. Infer something about the formation environment of a silicate mineral using only its formula. Predict the physical properties of a substance from its symmetry content. Be able to place the petrology of rock within their fundamental plate tectonic context. Plot crystal faces on a stereo projection. Travel anywhere in the world and speak intelligently about your surroundings.

Recommended Text Books/Reference books:

1. Gribble CD. 1998, Rutley's Elements of Mineralogy, Unwin Hyman, London.
2. Hurlbut S. and Klein C. 1977. Dana's Manual of Mineralogy, John Wiley & Sons.
3. Kerr PF. 1959. Optical Mineralogy, McGraw Hill, New York.
4. Klein C. 1989. Minerals and Rocks, John Wiley & Sons.
5. Nesse WD. 2003. Introduction to Optical Mineralogy, Oxford University Press London.
6. Perkins D. 2010. Mineralogy, Prentice Hall, New Jersey.
7. Schulze DJ. 2003. An Atlas of Minerals in Thin Section, Oxford University Press London.
8. William HB. 1990. Principles of Mineralogy, Oxford University Press London.

GEO 215 - SEDIMENTOLOGY (3 CH)

Pre-requisite: GES 101

Objectives & Learning Outcomes:

This course is designed to understand the fundamental to interpreting past climate and geography from the evidence in the rock record of the environment in which sediment was deposited. This course develops the skills needed to make such interpretations by cultivating proficiency at description and process-based interpretation of sedimentary successions, and showing how study of modern environments is used to decipher sedimentary processes.

Course Content:

Introduction; Sediments, their origin, transportation and deposition; Stratification, diagenesis, lithification and origin of sedimentary rocks; Depositional environments; Sedimentary basins; Sedimentary structures, their morphology and interpretation: Classification, composition and textures of sedimentary rocks and their descriptive study.

Recommended Text Books/Reference books:

1. Boggs, S., Jr. (2012) Principles of Sedimentology and Stratigraphy (5th edition). Pearson Prentice Hall, New Jersey
2. James, N.P., Dalrymple, R.W. (Eds.), 2010. Facies models 4. GEOtext 6, Geological Association of Canada

GEO 225 - GEOCHEMISTRY (3CH)

Prerequisite: CHM 105

Objectives & Learning Outcomes:

This course is designed to provide the basic understanding about geochemistry and how the distribution and dispersion of elements in minerals and rocks within different prevailing environments. How the geochemical signature / signatures are created to provide the heterogeneity that lead towards useful geochemical proxies / tools. These proxies can play an important role in the mineral exploration and in the provenance domain.

Course Content:

Introduction; Nature of geochemical data and methods of analysis; Composition of solar system, meteorites and the earth; Geochemical classification of elements; Factors governing behavior of elements in Geological processes; Eh and pH diagrams; Geochemistry of igneous, sedimentary, and metamorphic rocks; Geochemical cycle; Introduction to exploration, environmental and analytical geochemistry; Laboratory instrumentation and common analytical methods involving rocks, soils, minerals and water.

Recommended Text Books/Reference books:

1. Geochemistry by William, M. White, 2013, Wiley-Blackwell.
2. Principles of Geochemistry by Mason. B., 1966, John Wiley and Sons.
3. Geochemistry in Mineral Exploration by Rose, A. W., Hawkes, H. H. and Webb, J.S., 1983, Whitstable Litho Ltd.

4. Inorganic Geochemistry by Henderson, P., 1982, Pergamon Press Ltd. Geochemistry by Brownlow, A. H., 1996, Prentice Hall.
5. Geochemistry by Beaumont, E. A., and Foster, N. H., 1988, AAPG Special Bulletin, Publication No.8.
6. Geochemistry. Pathways and Processes by McSween, H. Y., Jr, Richardson, S. M. and Uhle, M. E., 2003, Columbia University Press, New York.

GEO 230 - GEOTECTONIC (3 CH)

Pre-requisite: GEO 205

Objectives and Learning Outcomes:

This course is designed to acquire the knowledge about plate tectonics, various types of plate boundaries, their kinematics and dynamics. This will help the students to conceive the mountain building phenomenon, understand seismicity, volcanism and metallogeny.

Course Contents:

Review of various tectonic theories; Historical development of the plate tectonic theory; Plate Movements, Mantle Plumes, Plate Boundaries, Detail study of plate tectonics; Orogenic belts and evolution of folded mountains; Young folded mountains of the earth with special emphasis on mountain belt in Pakistan; Regional Tectonics of Pakistan.

Recommended Text book/Reference Books:

1. Plate Tectonics: Continental Drift and Mountain Building, Wolfgang Frisch, Martin Meschede, Ronald C. Blakey, 2010, Springer.
2. Economic Geology and Geotectonics, Donald Harvey Tarling, 1981, Wiley
3. An Introduction to Seismology, Earthquakes, and Earth Structure. Stein, Seth; Wysession, Michael 2009. Chichester: John Wiley and Sons.
4. Plate Tectonics – Geodynamics, Turcotte, D. L.; Schubert, G. 2002, Cambridge University Press
Tectonics by Moores, E. M. and Twiss, R. J., 1995, W. H. Freeman and Co.

ENV 245 - INTRODUCTION TO OCEANOGRAPHY (3 CH)

Pre-requisite: GEO 101

Objectives and Learning Outcomes:

By the end of this course, I hope that you will have achieved the following: A greater interest in the oceans. Familiarity with basic terminology and descriptions of materials and processes in the subdisciplines of geological, physical, chemical and biological oceanography. An appreciation of the importance of the world ocean to our planet. A healthy skepticism of facts and an appreciation for where knowledge comes from. A desire to better protect the oceans through active involvement with government and environmental organizations.

Course Contents:

Fundamental oceanographic principles, Physical properties of sea, water, salinity, temperature, density, water masses, Oceanic budgets of heat, water and salt. Circulations and currents, waves, tides, tsunamis, monsoonal reversals. Estuarine circulation, sea water stratification, ocean acoustics, acoustic

attenuation in marine sediments, Chemical properties of marine environment, Typical distribution of sea water characteristics, Surface and deep ocean water circulation, Worldwide heat budget study.

Recommended Text book/Reference Books:

1. Denny, M. (2008). *How the ocean works: an introduction to oceanography*. Princeton University Press.
2. Chamberlin, W. S., & De Dickey, T. (2008). *Exploring the world ocean*. McGraw Hill/Higer Education.
3. Thurman, H. V., Trujillo, A. P., Abel, D. C., & McConnell, R. (1999). *Essentials of oceanography*. Upper Saddle River, NJ: Prentice Hall.

GEO 302 - GEOPHYSICAL EXPLORATION METHODS (3 CH)

Pre-requisite: GEO 115

Objective and learning outcomes:

To introduce fundamentals of Gravity and Magnetic methods, Principles and applications and provide opportunities to develop skill and undertake responsibilities for marines Gravity and Magnetic data parameter design, acquisition, processing and interpretation. To get the students acquainted with advances in research and evolving technology and state-of-the-art survey operations To understand the theory and applications of the Gravity and Magnetic methods of geophysics exploration; determine the Gravity and Magnetic operation parameters appropriate for any specialized exploration scheme; determine software algorithms appropriate for processing and interpretation of Gravity and Magnetic data

Course Content:

Introduction of Gravity and Magnetic Exploration, fundamental principles, units of gravity, roll of mass & density in gravity, distribution of density inside earth, methods of determining value of "g", gravity acquisition, flattening effect of earth, Bouger anomaly, regional and residual effect, Methods of finding out density & thickness of ore bodies, Introduction to magnetic method, magnetic force, magnetic induction & magnetic permeability, magnetism in rocks and minerals, remnant magnetization, susceptibility contrast, magnetism of earth (geomagnetism), hysteresis loop, interpretation of magnetic data.

Recommended Text book/Reference Books:

1. Basic Exploration Geophysics by Robinson & Crouh
2. Introduction to Geophysical Prospecting 4th by Edition.Dobrin & Savit
3. Exploration Geophysics -An Introduction, by Gadallah & Fisher
4. Fundamentals of Geophysics by Lowrie
5. Principles of Applied Geophysics By Parasnis
6. A first course in Geophysics exploration and interpretation By Sherriff
7. Applied geophysics By Telford et.al

GEO 305 - ENVIRONMENTAL GEOLOGY (3 CH)

Pre-requisite: GES 101

Objectives and Learning Outcomes:

The objectives of this course are to: improve the understanding of fundamental concepts of environmental geology; to learn to interpret environmental data for process studies; to describe the role of natural geologic processes--such as earthquakes, volcanic eruptions and slope failures--in creating conditions that impact human infrastructure and activities. After completion, students will be able to explain how human activity impacts natural geologic systems, geo-environmental settings and ecosystems on local, regional and global scales and how property damage and economic disruption of these natural and human-induced processes can be mitigated through planning with appropriate consideration of geologic factors.

Course Content:

Fundamental concepts of Environmental Geology; Soil; Earth Materials & Processes; Application of Geology to a broad environmental concerns of Society; Evaluation of natural hazards, floods, landslides, subsidence, earthquakes, volcanic activity and coastal erosion; Water resources; Waste disposal management; environmental related health effects; Environmental impacts of mining, petroleum and gas exploitation; Geology in land use and urban planning; Environmental Geology mapping; formation of earth resources and significant environmental effects caused by their extraction, processing, and use; Hydrologic cycle and theory of plate tectonics as related to natural hazards and earth resources & relationship to environmental hazards. Resources of water, soil, and sediment pollution and methods for their management. Explain the causes and effects of global climate change.

Recommended Text Books/Reference books:

1. Keller EA. 2011, Environmental Geology, 9th Edition, Pearson.
2. Keller EA. 2002, Introduction to Environmental Geology, 1st Edition, Prentice Hall
3. Montgomery CW. 2015. Environmental Geology, McGraw Hill.
4. Reichard J. 2013. Environmental Geology, 2nd Edition, McGraw Hill.
5. Valdiya KS. 2013. Environmental Geology: Ecology, Resource and Hazard Management, McGraw-Hill Education (India) Private Limited

GEO 315 - IGNEOUS & METAMORPHIC PETROLOGY (3 CH)

Pre-requisite: GEO 110

Objectives and Learning Outcomes:

This course is designed to acquire knowledge about the origin of magma and the role of magmatic and metamorphic process in the formation of igneous rocks. The learning outcomes include understanding the classification of various igneous rocks and their genesis in different tectonic settings; solid-state transformation of pre-existing igneous, metamorphic and sedimentary rocks into metamorphic rocks, familiarization with metamorphic processes and the resulting textures and structures in the metamorphic rocks.

Course Contents:

Nature and generation of magma; Magmatic crystallization and differentiation; Mode of occurrence and types of extrusive and intrusive igneous rock bodies; Structure and textures of igneous rocks; Classification and systematic study of igneous rocks; Processes and types of metamorphism and

tectonism; Field and Laboratory study of igneous rocks in Hand specimen study of igneous and metamorphic rocks; Field trip to igneous & metamorphic areas.

Recommended Text Books/Reference Books:

1. *Igneous and Metamorphic Petrology* by Best, M. G., 2002, Black Well.
2. *Petrology of Igneous and Metamorphic Rocks* by Hyndmann, D.W., 1995, McGraw-Hill.
3. *Igneous Petrogenesis* by Wilson, M., 1989, Unwin Hyman.
4. *Petrology: Igneous, Sedimentary and Metamorphic* by Blatt, H., Tracy, R. and Owens, D., 2005, W.H. Freeman and Co.

GEO 320 - MARINE GEOLOGY (3CH)

Pre-requisite: GEO 101

Objectives and Learning Outcomes:

This course will be able to demonstrate knowledge and understanding of: Have a solid grounding in marine geology and the framework provided by Plate Tectonics. Describe sediments found in different water depths and settings, and understand the sedimentary processes leading to their deposition. Describe the main geological and geophysical techniques for observing the seabed and sub-seabed. Understand the driving forces behind, consequences, and importance of sea-level changes in the geological record.

Course Contents:

Coastal environment & Biodiversity, Coastal features, Development of marine geology, contribution of deep sea drilling project and ocean drilling program. Hypsometry, topographic features of the ocean. Plate tectonics and sea floor spreading, major ocean basins, gulfs and seas. Geology of continental margins, estuaries, deltas, barrier islands and coral reefs. Sediment types and distributions, shelf sedimentation, oxygen and strontium—Isotope, deep sea sedimentation. Methods and instrumentation in marine geology. Worldwide sea level changes through time.

Lab: According to the marine and coastal environment and its resources using modern technologies.

Recommended Text Books/Reference Books:

1. Grotzinger, J., Jordan, T. H., & Press, F. (2010). *Understanding earth*. Macmillan.
2. Erickson, J., & Kusky, T. M. (2009). *Marine geology: exploring the new frontiers of the ocean*. Infobase Publishing.
3. Keen, Michael John. *An introduction to marine geology*. Elsevier, 2017.

GEO 325 - STRATIGRAPHY OF PAKISTAN (3CH)

Pre-requisite: GEO 101

Objectives & Learning Outcomes:

This course is designed to acquire the knowledge and basic understanding for basin division of Pakistan, to understand stratigraphic depositional sequence from Precambrian to Cambrian. After completion, the student will be able to, construct and interpret chronostratigraphic charts of Pakistan with the strong

background knowledge of paleogeography and paleontological distribution within the Indus basin and its surrounding.

Course Content:

Principles of stratigraphy; laws of superposition and faunal succession; geological time scale with divisions; Unconformities, classification and nomenclature of stratigraphic units: lithostratigraphic, biostratigraphy and chronostratigraphic units; contacts; litho-and-biofacies; principle of stratigraphic correlation; Stratigraphic code of Pakistan; outline of stratigraphy of Pakistan; principles of biostratigraphy and biostratigraphy zones.

Labs: Preparation of stratigraphic columns and their correlation, facies maps, isopach, stratigraphic map.

Recommended Text Books/Reference books:

1. Stratigraphy of Pakistan S. M. Ibrahim Shah Government of Pakistan Ministry of Petroleum & Natural Resources Geological Survey of Pakistan, 2009
2. Kadri, Iqbal B. Petroleum geology of Pakistan. Pakistan Petroleum Limited, 1995

GEO 335 - EARTHQUAKE SEISMOLOGY (3 CH)

Pre-requisite: GEO 110

Objectives and Learning Outcomes:

This course is designed: to enumerate the fundamentals of earthquakes, theories and principles, earthquake parameters to groom the students about interdisciplinary research by integrating the classical knowledge of earthquakes with earthquake engineering, geography, social sciences, and environmental sciences, etc. It is expected that students will be able to objectively learn the fundamentals of seismology to assess the inter-relationship of earthquake seismology with other sciences and environment, especially during the last few centuries.

Course Content:

Causes and effects of earthquakes; Methods to locate and to assign magnitudes to earthquakes; Types of elastic waves, their propagation, travel-time curves and applications to the study of earth's interior; Earthquake risk analysis and expectations; man-made earthquakes and seismometer; Earthquake Seismology and the mathematical analysis of seismological processes on the basis of elastic wave theory; Seismic waves and their analysis in earthquake seismology; Frequency, magnitude, energy of an earthquake and their relationship; Source parameters and their determination; Composite fault plane solutions of earthquakes and their determination; Geographical distribution of important earthquakes; Earthquakes and their implication on the tectonics of the area; Specified problems on data processing analysis; fault solutions and interpretation.

Recommended Text Books/Reference Books:

1. Shearer, P. M. (2019). *Introduction to seismology*. Cambridge university press.
2. Stein, S., & Wysession, M. (2009). *An introduction to seismology, earthquakes, and earth structure*. John Wiley & Sons.
3. Bullen, K. E., Bullen, K. A., Bullen, K. E., & Bolt, B. A. (1985). *An introduction to the theory of seismology*. Cambridge university press.

4. Lee, W. H., Jennings, P., Kisslinger, C., & Kanamori, H. (Eds.). (2002). *International Handbook of Earthquake & Engineering Seismology, Part A*. Elsevier.

GEO 345 - PETROLEUM GEOLOGY (3 CH)

Pre-requisite: GEO 205

Objectives and Learning Outcomes:

This course is designed to acquire the knowledge about the processes involved in the formation, migration and accumulation of petroleum in the rocks and drilling and well logging techniques for petrophysical evaluation and production of oil and gas. This will help the students to learn about the global occurrences of oil and gas with special emphasis on Pakistan so that they can effectively use their knowledge in the exploration and development of the country's energy resources.

Course Content:

Introduction; Properties of petroleum and natural gas; Origin, migration and accumulation of hydrocarbons; Related source, reservoir and seal rocks; Reservoir properties; Various types of Geological traps for hydrocarbon accumulation; Concept of petroleum province and introduction to basin analysis.

Labs: Preparation of various types of subsurface maps, e.g. isopach, isochore and isoliths etc. Preparation of fence diagrams. Identification of pay zone, analysis of pyrolysis data and correlation diagrams. Visits to well/drilling sites.

Recommended Text Books/Reference books:

1. Elements of Petroleum Geology, Richard C. Selley, 1998, Acad. Press.
2. Hydrocarbon Exploration and Production: Frank Jahn, Mark Cook and Mark Graham, 1998, Elsevier.
3. Bhagwan Sahay, Awadesh Rai, Manoj Ghosh, 1988, Wellsite Geological Techniques for Petroleum Exploration: Methods and Systems of Formation Evaluation, Oxford and IBH Pub.
4. Allen and Unwin 1985. Petroleum Geology Ed. by North, F. K., 1985.,
5. Geology of Petroleum by Leverton, A. I., 1970, W. H. Freeman and Co.
6. Geology and Tectonics of Pakistan by Kazmi, A. H. and Jan, M. Q., 1997, Graphic Publishers.

GEO 350 - GEOLOGY OF PAKISTAN (3CH)

Pre-requisite: GEO 230

Objectives and Learning Outcomes:

This course will enable the students to acquire knowledge about exploration trends and techniques, Tectonics and depositional settings, Lithostratigraphic divisions of various geological periods. Shale gas and oil and Environmental impacts.

Course Content:

Introduction of general geology and tectonics of Pakistan. Physiographic and tectonic divisions; geology and stratigraphy of the accreted terrains such as Karakoram and Kohistan plate, Indian plate, stratigraphy and structure of foreland basins, Chamman fault, Makran convergence zone, and southern Indus basins, oroclines and suture zones. Himalayan and pre-Himalayan orogenic events, magmatism and metamorphism (pre-Himalayan and post-Himalayan); Evolution of Arabian Sea; Geology of Pakistan offshore Basins.

Labs: Reconstruction of continents through times, regional tectonic elements of the Pakistan, geology and tectonics of Salt Range/Kohat-Potwar Plateau, Sulaiman/Kirthar fold belt, Makran convergence zone, on-and-offshore Pakistan.

Recommended Text Books/Reference Books:

1. *Geodynamic of Pakistan by Farah, A., and Dejong K. A., 1979, Geological Survey of Pakistan.*
2. *Marine Geology and Oceanography of Arabian Sea and Coastal Pakistan by Haq, B. U. and Milliman, G. D., 1984, Jan Nostrand Reinhold Co.*
3. *Petroleum Geology of Pakistan by Kadri, I. B., 1995, Pakistan Petroleum Limited.*
4. *Petroleum Source Rocks of Pakistan by Raza H. A., 1991, Int. Petroleum Seminar, Sp. Publ.*
5. *Petroleum for Future by Raza, H. A. and Sheikh, A. M., 1988, (HDIP),*
6. *Geology and Tectonics of Pakistan by Kazmi, A. H. and Jan, Q., 1997, Graphic Publishers.*
7. *Geology of Pakistan by Bender and Raza, 1995, Gebruder Borntraeger.*
8. *Selected technical proceedings of PAPG and SPE meetings*
9. *Stratigraphy and historical geology of Pakistan by Kazmi, A. H and Abbasi,*

GEO 410 - ENGINEERING GEOLOGY (3CH)

Pre-requisite: GEO 230

Objectives and Learning Outcomes:

This course is designed to acquire the knowledge about rock mechanics and their role in the construction of huge structure. This will help the students in learning various techniques of determination of physical and geotechnical parameters of soils and rocks for construction of buildings and foundations. Upon successful completion of the course, the student will be able to identify basic concept of engineering geology, applications and engineering rock mass classification, to understand the concept of strength, chemical and mechanical behavior of rock and to review building code, common engineering problem and their remedial measures.

Course contents:

Basic concept of Engineering Geology; Mass-wasting, landslide and other rock movements; Uplift and settlement problems; Excavation and tunneling; Introduction to soil mechanics; Classification and characteristics of soil; Engineering properties of soil; Introduction to rock mechanics, stress and strain characteristics in deformation of rocks; rock classification; rock engineering properties; Geology of the engineering structures: dams, tunnels, bridges

Lab: According to the engineering properties of soil, rock, and sediments for civil engineering projects.

Recommended Text Books/Reference Books:

1. *Engineering Geology by Beavis, F.C., 1985, Blackwell.*
2. *Measuring Engineering Properties of Soil by Wray, W.K., 1986, Prentice, Hall.*
3. *Fundamentals of Engineering Geology by Bell, F.A.G., 1983, Butter, Worth.*
4. *Geology for Engineers by Blyth, F.G.H. and DeFreites, M.H., 1960, Butter and Tonner Ltd.*

GEO 425 - RESEARCH METHODOLOGY (2 CH)

Pre-Requisite: Completion of Courses till semester-V

Objectives and Learning Outcomes:

This course is designed to: explain research terminology; identify the components of a literature review process (reading, evaluating, and developing). Identify, explain, compare, and prepare the key elements of a research proposal/report. Define and develop a possible research interest area using specific research designs. Compare and contrast quantitative and qualitative research. Demonstrate how educational research contributes to the objectives of your BS program and to your specific career aspirations. Be aware of the ethical principles of research, ethical challenges and approval processes. Critically analyze published research.

Course Content:

An Overview of Research Methods and Methodologies; Difference Between “Method” and “Methodology”; Epistemology, Methodology, and Method; An Overview of Empirical Research Methods: Descriptive (Qualitative) & Experimental (Quantitative); Assessing Methods; Ethnographies; Case Studies; Survey Research; Focus Groups; Discourse/Text Analysis;

Quantitative Descriptive Studies; Prediction and Classification Studies; Meta-Analysis; Validity in Research; Reliability in Research; Rigor in Research; Key Considerations to Design Your Research Approach; The Importance of Methods and Methodology

Lab: Preparation of research proposal through literature review and methodology development by using statistical methods.

Recommended Text Books/Reference Books:

1. Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.
2. Walliman, N. (2017). Research methods: The basics. Routledge.
3. Tuckman, B. W. & Harper, B. E. (2012). Conducting educational research (6th ed.). Lanham, MD: Rowan & Littlefield Publishers. (ISBN: 978-1-4422-0964-0)
4. Creswell, J. W. "Research design: qualitative, quantitative, and mixed methods approaches." (2003).

GEO 437 - GIS & REMOTE SENSING (3CH)

Pre-requisite: GEO 110

Objectives and Learning Outcome:

To provide basic concepts and principles of Remote Sensing and Geographic Information System. Fundamentals of mapping techniques and spatial data collection. After studying this course, the students will be able to: Define and describe the terms of Remote Sensing and GIS. Understand the basic principles of Remote Sensing. Evaluate the applications of Remote Sensing in various disciplines

Course Content:

Introduction to Geographical Information System, Data Types (spatial/non-spatial), Data Models and Structures (Raster / Vector), GIS Data Sources and Satellite Image Capturing Techniques, Displaying and Manipulating spatial information, Vector Data Models such as rivers, coastal features, water bodies, etc. Preparation (Digitization and Spatial Data Editing), GPS Survey, Introduction to the concept of RS, Electromagnetic Spectrum, Atmospheric Interaction, Technology of Remote Sensing (Orbits, Satellites,

Sensors and Platforms), Applications of Remote Sensing, Satellite Image Processing Cycle, Image Enhancement, Data Fusion and Mosaicking Information Extraction (Classification and Vectorization). Photogrammetry, Satellite Imageries, Image Processing, Interpretation, Preparation of thematic maps, Image Data analysis and output.

Recommended Text book/Reference Books:

1. Campbell, James B. (2011). Introduction to Remote Sensing, 5thEd. The Guilford Press.
2. Lillesand, T. M. & Kiefer, R. W. (2010). Remote Sensing and Image Interpretation, 6th edition. John Wiley and Sons Inc.
3. Chang, K. T. (2010), "Introduction to Geographical Information Systems" Higher Education, McGraw-Hill.
4. Clarke, K. (2010), "Getting started with Geographic Information System", 5th Edition, Prentice Hall, New York. ISBN –10: 0131494988

ENV 425 - OCCUPATIONAL HEALTH & SAFETY (3CH)

Pre-requisite: Semester VI & above

Objectives & Learning Outcomes:

To learn about procedures, protocols and practical safety tools and strategies for recognizing, evaluating and controlling chemical, biological and physical hazards in field and workplace; exploration sites; machinery etc.

Course Contents:

An overview of the historical background, basic principles, practical tools and strategies for recognizing, evaluating and controlling chemical, biological and physical agents in the workplace.

Recommended Books & References:

- To be included

Field Work Courses: (3 Field work Courses offered with 2CH each)

GEO 280 - GEOSCIENCES FIELD WORK-I (2 CH)

Use of field instruments; Basic Geological mapping procedures; Identification of mineral and Rocks and coastal features & resources

GEO 380 - GEOSCIENCES FIELD WORK-II (2 CH)

One-week fieldwork for mapping of terrains and their structures, coastal environment & morphology by using Geological, geophysical and GIS/RS Techniques; measurement of stratigraphic sections.

GEO 480 - GEOSCIENCES FIELD WORK-III (2 CH)

One-week fieldwork in order to introduce Method of data collection; Geological and Geophysical field techniques; Interpretation/Report writing.

SPECIALIZATION COURSES (Semester VII – VIII)

GEO 415 - ECONOMIC GEOLOGY (3 CH)

Pre-requisite: GEO 215

Objectives and Learning Outcomes:

The objectives of this course are to: familiarize with common terminologies in economic geology and mineral exploration. Understand why certain parts of the earth are mineralized by introducing mineralization controls. Introduce the screens for profitability in mining ventures and mineral markets. To learn various types of the major ore deposits and their impact on the economy of the countries where they occur.

Course Content:

This course covers the distribution, geological setting and genesis of metalliferous mineral deposits. Factors controlling the formation of these deposits and the linkages with many other geologic processes covered in other courses are explored. Practical work involves study of a range of classic mineral deposits. It includes: Introduction and historical development of economic Geology; Processes of formation, classification and importance of mineral deposits; Physical and Chemical controls of mineral deposition; Wall rock alteration; Para genesis and zoning; Occurrence, association of ore deposits; Hand specimen studies of common metallic and industrial mineral. Electrical methods — Basic theory; Electrical properties of rocks and minerals; Self potential method — Basics; Self Potential method — field and interpretation; Self Induce Polarization method — principles and theory; IP method — field survey and interpretation — study of a case history; Resistivity method — basic theory; Electrical resistivity — relations and measurements; Resistivity and Properties of materials; Acquisition and Processing of Data Interpretation; Radioactive methods — Basic theory; Radioactive minerals and Survey Interpretation.

Laboratory work: According to Geography & locations economic. On satisfying the requirements of this course, students will have the knowledge and skills to: Recognize common ore minerals in hand samples, mineral deposits, including recognizing the overall geometry, zonation and alteration patterns associated with specific classes of metallic mineral deposits. Evaluate different processes of element enrichment by fluids and melts to from ore bodies.

Recommended Text Books/Reference books:

1. Baumgart W. Dunham AC. and Amstutz GC. 1998. Mineralogy of Ceramic Materials, Enke, Stuttgart.
2. Edwards R. and Atkinson K. 1986. Ore Deposit Geology, Champman and Hall.
3. Evans AM. 1982. An Introduction to Ore Geology, Blackwell.
4. Jensen ML and Bateman AM. 1981. Economic Mineral Deposits, Willey.
5. Mitchell ML. and Garson MS. 1981. Mineral Deposits and Global Tectonic Settings, Academic Press, London.
6. Park JCF. and MacDiarmid RA. 1970. Ore Deposits, WH Freeman & Co., San Francisco.

GEO 420 - HYDROGEOLOGY (3 CH)

Pre-Requisite: All basic geology

Objectives and learning outcomes:

To understand hydrosphere, its functioning and importance; to enhance the geological knowledge by adding another perspective when analyzing a given problems, the problem of water and its connection with the land; to impart critical analytical skills that would aide students in solving practical problems in

the industry that relate to water management, flow and pollution. To impart problem solving skills in hydrogeology that cover ecology and life science as well. To build strong foundation of hydrologic components. To be able to quantitatively describe the Can formulate a scientific problem and design a strategy to address it in a proposal. To be effectively communicate their scientific knowledge through written and oral presentations.

Course Content:

Introduction to the hydrology of surface and groundwater supplies; hydrosphere, its functioning and importance; Water bearing properties of rocks; hydrodynamics of flow though porous Materials; Flow nets; Well hydraulics; Analysis and evaluation of pumping test data; Groundwater quality; Occurrence of groundwater in various rock types and sediments; Introduction to techniques used in groundwater exploration and survey. Behavior of hydrogeological systems and measurement with physics-based mathematical models.

Laboratory work: According to topography, Geography & Location. Hydrogeological systems and measurement with physics-based mathematical models.

Recommended Text Books/Reference Books:

1. Applied Hydrogeology by Fetter, C. W., 1994, MacMillan Pub. Co.
2. Groundwater By Freeze and Cherry
3. Groundwater Hydrology by Todd, D. K., 1995, John Wiley and Sons.
4. Hydrogeology: Principles and Practice by Kevin M. Hiscock and Victor F. Bense
5. Hydrology and Water Quality Control by Martin Wanielista

GEO 441 - APPLIED BOREHOLE GEOPHYSICS (3CH)

Pre-requisite: GEO 302

Objective and Learning Outcomes:

The objective of this course is to provide log practitioners with a solid understanding of the principles and applications of open hole well logging data. Open hole well logging is fundamental to the quantification of hydrocarbon resources during the exploration and appraisal phases and to reservoir delineation and surveillance during the development and production phases. Outcomes of the course, student of BS will be able to: Scan a well log for quality control, Define zones of interest on a log, Implement basic log quality control and environmental corrections, Determine Archie parameters and using to determine saturations, Design and supervise a basic logging operation, Decide where and when advanced logging technologies may be required, reservoir characterization.

Course Content:

Introduction; Types of Logs; Methods and principles; Factors influencing Logs; Caliper logs Resistivity logs; SP logs; Gamma Ray logs; Formation density logs; Neutron logs; Sonic logs; Dip meter logs. Application of logs; Flowmeter log; Temperature logs; Electromagnetic-induction logs; Acoustic-television logs; Casing Logging; Borehole-Deviation. Reservoir Characterization: Porosity determination; Lithology and hydrocarbon detection; logs interpretation & their Correlations.

Laboratory work: According to applications of various well logs interpretation for lithology identification of oil & gas reservoirs, etc.

Recommended Text Books/Reference Books:

1. Geological Interpretation of Well Logs Paperback – December 31, 1999 by Malcolm H Riderfd
2. Well Logging for Earth Scientists Darwin V. Ellis

GEO 444 - APPLIED GIS & RS TECHNIQUES (3 CH)

Pre-requisite: GEO 304

Objective and Learning Outcomes:

The course is designed to enhance the professional skills aligned with the latest advancements in GIS and RS techniques applied for integrated studies. After studying this course, the students will be able to: acquire skills and knowledge on the selection, integration, spatial analysis/modeling and visualization/communication of spatial information using GIS; Learn to identify and translate a spatial research question into a GIS modeling problem / solution.

Course Content:

Scope of Geographical Information System and Remote Sensing in Geology & Geo-physics; Application of GIS & RS in Geosciences to understand the utilization of Data bases for various Geosciences projects; Building of Geo-Spatial dataset (its acquisition and development); ArcGIS environment; Concepts of Spatial layering in GIS; Spatial Data Analysis

GIS Software Lab: Introduction to Open Source Software; Introduction to Geo-processing ; Geo-referencing; Handheld GPS based survey; Incorporation of spreadsheet data with GIS; Creating shape file and spatial database files; Digitization [preparation of Land-use Map]; Generating Maps in form of PDF/Jpeg etc.

Recommended Text Books/Reference Books:

1. Stillwell, J. (2005) "Applied GIS and Spatial Analysis", John Wiley & Sons, Ltd. England.
2. Peter M. Atkinson and Nicholas J. Tate, Advances in Remote Sensing and GIS Analysis, 1999, John Wiley & Sons, UK, P-273
3. Paul, L., Michael, G., David, M. & David, R. "Geographic Information Systems: Principles, Techniques, Applications and Management". John Wiley & Sons, 1999

GEO 445 - SEISMIC STRATIGRAPHY (3 CH)

Pre-requisite: GEO 115

Objective and Learning Outcomes:

Seismic stratigraphic techniques are based upon an integration of firm, well-established geological and geophysical fundamentals. When properly applied, seismic stratigraphy provides a powerful foundation for geo history analysis, helping describe a basin's evolution and the resulting effects upon its spatial and temporal variation in hydrocarbon potential. This course is designed to acquire the knowledge on geophysical fundamentals to uncovering the geological information embedded within seismic. Understand the premises behind the Vail seismic sequence paradigm. Construct and interpret chronostratigraphic charts, sea level curves, and seismic facies maps. Interpret clastic and carbonate depositional system responses to alycyclic and auto cyclic processes and the effects upon reservoir architecture and seal potential. Systematically reconstruct a basin's geo history which provides the critical foundation for its petroleum system analysis and effective exploration.

Course Content:

Introduction; Seismic stratigraphic approach; Recognition and discrimination of depositional sequence; Boundaries of depositional sequences; Stratigraphic interpretation of seismic facies; Principal types of seismic facies; Recognizing and evaluating unconformities; Factors controlling deposition of cyclic sequences; Origin of cyclic sequence; Application of seismic stratigraphy in hydrocarbon exploration; Basin classification; Classification and structural styles related to strike slip, Thrust tectonics; Source rocks and its types. Interpretation of logs and other relevant data to identify areas favorable for hydrocarbon exploration.

Laboratory work: According to On-shore/Offshore Stratigraphy, Geography & Location.

Recommended Text Books/Reference books:

1. Emery, D., and Myers, K.J. (1996) sequence stratigraphy . Blackwell, Oxford.
2. Catuneanu, Octavian, "Principles of sequence stratigraphy", Elsevier.
3. Coe, Angela, Dan Bosence, Kevin Church, Steve Flint, John Howell and Chris Wilson, (2002) "The Sedimentary Record of Sea Level Change".

GEO 461 - COASTAL GEOLOGY & GEOMORPHOLOGY (3 CH)

Pre-requisite: GEO 320

Objective and Learning Outcomes:

The objective of this course is to provide students with a state-of-the-art knowledge of current research on the geology and geomorphology of forested landscapes and their stream networks such that the students achieve the following learning outcomes: develop the fundamental geospatial skills and concepts needed to assess the coastal processes and hazards discussed in this course; link geologic time and current shoreline processes in order to explain the past and present evolution of coastline morphology; assess the economic and social impacts of coastal hazards; select optimal engineering options to mitigate specific risks; assess how government and stakeholders can plan for and respond to coastal hazards. Knowledge of the major concepts of fluvial geology and geomorphology of landscapes.

Course Content:

Fundamental geospatial skills and concepts of coastal processes and hazards; Coastal and near shore geology. Coastline morphology: Waves and wave dominated coast, Neo-tectonics. Shore line morph dynamics; geologic time and current shoreline processes; Tidal and lake coast. Long term development of coast. Sea level changes. Sub-tidal and tidal ecosystem. The management of coastal water. Land and sediments. Coastal Hazards and Coastal Dunes. Development of Delta. Geology and geomorphology of forested landscapes

Laboratory work: According to Geography & Location.

Recommended Text Books/Reference Books:

1. Davidson-Arnott, R., Bauer, B., & Houser, C. (2019). *Introduction to coastal processes and geomorphology*. Cambridge University Press.
2. Masselink, G., Hughes, M., & Knight, J. (2014). *Introduction to coastal processes and geomorphology*. Routledge.
3. Davis, R. J. (Ed.). (2012). *Coastal sedimentary environments*. Springer Science & Business Media.
4. Bird, E. C. (2011). *Coastal geomorphology: an introduction*. John Wiley & Sons.

GEO 462 - PHYSICAL OCEANOGRAPHY & SURVEYING (3 CH)

Pre-requisite: ENV 245

Objective and Learning Outcomes:

By the end of this course, we expect all students to be familiar with the main features of the world ocean circulation and hydrography, with the main classes of ocean waves, with other important processes such as mixing, and with the dynamic balances that govern these phenomena and processes. Learn about many of the physical processes that occur in the ocean. Learn about how these physical processes are observed and quantified. Learn about where these processes occur in the ocean. Learn about and access recent ocean datasets. Get practice writing and thinking scientifically by focused study on particular processes.

Course Content:

Representation of annual wave period percentage frequency of the given region in the form of bar-diagram/histogram and its study. Representation of wave direction data in the form of rose diagram and their study. Interpretation of wave climate for the given data. T-S diagrams. CSS diagram and study of waves. Wave forecasting and Wave refraction study. Observation and study of different wave breaker types. Study of waves during rough and fair weather seasons. Preparation and study of tidal curves (mean tidal range, spring and neap tidal range - for different months). Calculation of velocity of sound using Nomograph. Study of major surface current patterns of the Indian Ocean. Study of major surface current patterns of the Atlantic Ocean. Study of major surface current patterns of the Pacific Ocean. Deep ocean circulation in the Atlantic Ocean. Littoral drift study in the field & lab using dye & tracer techniques.

Laboratory work: According to Geography & Location.

Recommended Text Books/Reference Books:

1. Stewart, R. H., 2008: Introduction to Physical Oceanography. R. H. Stewart (online website self-publication), URL http://oceanworld.tamu.edu/ocean410/ocng410_text_book.html.
2. Coastal Environnements by Carter, R. W. G, 1988, Academic Press. London.
3. A Work book in Oceanography, Dudley, W. C and Min Lee, 1982, Alpha Editions, A division of Burgess Publishing Co. Minnesota.
4. The Sea by Emiliani. C. 1981, John Wiley. New York.
5. Sea water: Its Composition, Properties and Behavior by Gerry, B., 1989. Pergamon Press plc Oxford and Open University Walton Hall, Milton, England.
6. Oceanography, An Introduction to the planet Oceanus by Pinet, Paul R. 1992, West Publishing Company, New York.
7. Laboratory Exercises in Oceanography by Popkin, B. W, Grosline, D. S and Hammond, D. E., 1987, 2nd Edition. W. H. Freeman and Company. New York.

GEO 463 - OCEAN CRUST SEDIMENTATION (3 CH)

Pre-requisite: GEO 215

Objective and Learning Outcomes:

The purpose of this course is to give you the knowledge and skills necessary to describe, understand, and interpret sediments, sedimentary rocks and oceanic sedimentary environments. Knowledge about various types of sedimentary rocks and their diagenesis. Course will help to understand the classification and depositional system of the sedimentary rock. The history of the earth is to a large degree written in sedimentary rocks. The ultimate goal of this course is to give you the ability to make careful observations,

and from these interpret and understand modern and ancient sedimentary environments and stratigraphic successions.

Course Content:

Formation of Ocean Crust sedimentation. Classification and depositional system of the sedimentary rock and oceanic sedimentary environments; interpret sediments, Marine Organism and chemical reaction in sediments formation on ocean belt. Study of erogenous, biogenesis, hydrogenation, and cosmogenesis sediments. Turbidity currents, turbidites and carbonaceous sediments, Ocean sedimentary structures and its morphology and texture.

Laboratory work: According to Stratigraphy, Geography & Location.

Recommended Text Books/Reference Books:

1. Julien, P. Y. (2010). *Erosion and sedimentation*. Cambridge university press.
2. Leeder, M. R. (2012). *Sedimentology: process and product*. Springer Science & Business Media.
3. Leeder, M. R. (2009). *Sedimentology and sedimentary basins: from turbulence to tectonics*. John Wiley & Sons.
4. Kelling, G., & Stanley, D. J. (1978). *Sedimentation in submarine canyons, fans, and trenches* (pp. 138-59). Dowden, Hutchinson & Ross.

GEO 475 - SEISMIC DATA INTERPRETATION (3 CH)

Pre-requisite: GEO 115

Objective and Learning Outcomes:

This course is designed: to enumerate the fundamentals of Seismic interpretation. To acquire basic skills in interpretation of 2-D/3-D seismic data. to gain theoretical knowledge of seismic structural interpretation, stratigraphic interpretation; to master the seismic interpretation software and reservoir identification and evaluation, and horizon and formation attributes.

Course Content:

Seismic data analysis techniques, Geological constraints regarding seismic data interpretation, Importance of seismic data quality, QC of data, Geological implementation in the seismic data, Seismic to well tie, Tying methods, Seismic correlation techniques, e. g Jump tie, loop tie, Interpretation ways, Mapping, 3 D surfaces, Practical implementation of different Software like OpenDTECT/Kingdom/Geographix/Petrel (Licensed software).

Laboratory work: According to Geomorphology (offshore & on shore), Geography & Location.

Recommended Text Books/Reference Books:

1. Hart, B. S. (2004). Principle of 2D and 3D seismic interpretation. McGill University.
2. Brown, A. R. (2011). Interpretation of three-dimensional seismic data. Society of Exploration Geophysicists and American Association of Petroleum Geologists.
3. Andrew, J. A. (1985). The art and science of interpreting stratigraphy from seismic data.

GEO 481 - GIS DATABASE MANAGEMENT (3 CH)

Pre-requisite: CSC 205

Objectives and Learning Outcomes:

The course is designed: to introduce the concepts of modern database systems and their applications in different disciplines and spheres of life; to introduce the basic concepts of GIS programming and web. The learning outcomes will be understanding of the modern database systems and their working; an understanding of the relational databases and its advantages over traditional systems; Knowledge of database administration.

Course Content:

Fundamentals of geographical databases; Fundamentals of Python; Usage of variables and special data types; Naming conventions and reserved words; testing and printing variable values; Looping and control structures; Debugging; optional and required parameters; Objects, properties and methods; Object Model Diagrams; The geo-processor object introduction; Functions and parameters, passing and returning values; Multiple inputs and complex parameter passing; Selections and sets; SQL basics; Writing results to disk, various formats and switches; Advanced topics and further directions; Num.py for numerical modeling; Architecture of Arc Objects; Main Arc Objects classes, classes and interfaces

Lab: Introduction to Lab; Looping statements; Getting and setting object parameters; Creating features and feature classes; Editing layer's display properties; Changing/editing and summarizing attribute data; Exploring the geo-processor object; Projects

Recommended Text Books/Reference Books:

1. Mark L. Gillenson (2005) Fundamentals of Database Management Systems John Wiley & Sons
2. Kropka, B. (2005) "MapServer: Open Source GIS Development" Apress, Co. ISBN: 1590594908
3. Michael Worboys, Matt Duckham (2004) GIS: A Computing Perspective, 2nd Edition CRC Press; 2nd edition ISBN: 0415283752
4. Date, C.J. Database Systems, Addison Wesley Pub. Co. (2004) ISBN –0201385902

GEO 482 - SATELLITE IMAGE PROCESSING (3 CH)

Pre-requisite: GEO 304

Objectives and Learning Outcomes:

The course is designed to enhance the professional skills aligned with the latest advancements in Remote Sensing and Digital Image Processing. After studying this course, the students will be able to: Understand the advances in Remote Sensing technology; Analyze optical, thermal and microwave remotely sensed data sets; Apply advance remote sensing techniques in earth resource management.

Course Content:

Data Sources and acquisition; Characteristics of grey-level digital images; Types of Image data Formats; Pre-processing (Image stacking, Sub-setting (Geometric and Atmospheric Corrections); Image Rectification and Registration; Re-sampling; Image transformation (Geometric and Affine); Batch Processing; Image Mosaicking and Color Balancing; Image Enhancement (Grey level transformations, Histogram equalization,); Image Filtering (Pan-sharpening, Fourier descriptors, Linear and non-linear filtering operations, Image and Separable convolutions, Sub-sampling and interpolation as convolution

operations); Image Indices (NDVI, NDWI, NDSI, Leaf Area Index, etc); Image Classification (Types, Algorithms and Spatial modeler techniques); Signatures selection, feature space and evaluation; Principal component analysis; Morphological operations; Accuracy Assessment and Field Verification

Lab: Intro to lab and software; Hands on training on Spatial modeler in ERDAS Imagine; Atmospheric correction of multi-spectral and hyper-spectral data sets; Image Management (Import/Export & Display); Image Enhancement Techniques (Histogram equalization, filtering); Spectral and spatial digitizing; Mosaicking and color balancing; Rectification, Registration and Re-sampling; Image processing techniques; Signature selection; Accuracy Assessment and Field Verification; Individual/Group project with field work.

Recommended Text Books/Reference Books:

1. Aronoff, S. (2005) Remote Sensing for GIS Managers. Redlands. California: ESRI Press ISBN: 1-97815894808102.
2. Campbell, James B. (2011) Introduction to Remote Sensing, 5thEd., (The Guilford Press) ISBN: 9781609181765.
3. Mather, P M (2011). Computer Processing of Remotely Sensed Images, 4thEd. (John Wiley and Sons), ISBN: 9780470742389
4. Jensen, J. (2009) Remote Sensing of the Environment: An Earth Resources Perspective, 2ndEd. Pearson Publishers, ISBN: 97881317168095.
5. Landgrebe (2003) Signal theory methods in multispectral remote sensing, John Wiley and Sons ISBN: 0-471-42028-X

GEO 483 - GIS DATA ANALYSIS & MODELLING (3 CH)

Pre-requisite: GEO 305

Objectives and Learning Outcomes:

This course attempts to provide an understanding to the spatial data structures, processes and analysis involved in data modelling. The students will be able to understand the advances in GIS based data analysis, mapping and modelling techniques.

Course Content:

Introduction to spatial data types; Potentials of spatial data; Modeling and storing field data; Cluster analysis Boundary Analysis; Spatial Analyses; Point pattern analysis; Spatial Autocorrelation; Buffering, proximity and neighborhood functions; Spatial interpolation, type, Methods / algorithms, Derived measures on surfaces; Polylines and network Analyses; Area objects and types of area objects; Geometric properties of areas; Map overlay; Vector and raster overlay operations; Ordinary Least Squares & Geographically Weighted Regression Techniques; Problems in simple Boolean polygon overlay; Multivariate data and multidimensional space; New approaches to spatial analysis; Surface modeling, DTM/DEM/DSM; Multi-criteria and Multi-attribute Decision Making; Uncertainties in spatial modeling.

Lab: Assignment on Spatial Analysis for various applications; Geo-coding Point analysis exercise; Interpolation of point data and surface modeling; Network analysis exercise; Aerial analysis exercise; Buffer analysis exercise; Multivariate analysis; Assignment on advanced spatial analysis; Suitability analysis; Risk Modeling, Assignment on uncertainties in spatial modeling

Recommended Text Books/Reference Books:

1. Fotheringham, S., Brunsdon, C., Charlton, M. E. (2000) "Quantitative Geography: Perspectives on Spatial Data Analysis", SAGE Publications ISBN: 0761959483
2. Clarke, K. (2010) "Getting started with Geographic Information System", Prentice Hall, New York, 5th Edition. ISBN -10: 0131494988
3. Fotheringham, S., Brunsdon, C., Charlton, M. E. (2000) "Quantitative Geography: Perspectives on Spatial Data Analysis", SAGE Publications ISBN: 0761959483

GEO 484 - CARTOGRAPHY & MAPPING (3 CH)

Pre-requisites: CSC 205

Objectives and Learning Outcomes:

The course is designed to foster the skills by providing basic knowledge of portraying spatial features from reality by using cartographic techniques; Providing training in coordinates and projection systems and map classification techniques. After studying this course, the students will be able to: Define and describe the terms digital Cartography and its concepts; Understand the basic principles of digital Cartography; Apply the Knowledge to create digital maps in formats reflecting the purpose, content and function of input data.

Course Content:

Introduction to Cartography and its history, Nature of Cartography, Map Types (Choropleth, Proportional Symbol, Dot, Isarithmic, Cartograms Flow, and Graduate Color Maps), Symbols, Lettering, Scale and direction, Map Projections, Datum and Coordinate Systems, Generalization, Land Use/Land Cover Schemas: standards for land cover/land use classification schemes Survey of Pakistan, Food and Agriculture Organization (FAO), United States Geological Survey (USGS), Coordination of Information on the Environment (CORINE). Thematic Maps, Descriptive Statistics, Class Intervals, Map Compilation, Map Design, Cartography and Ethics, Map Production, Project.

Lab: Map reading, Assignment on Types of Maps, Understanding of Survey of Pakistan (SOP) symbology and Development of Symbol Charts, Development of Graphical Map Projections, Development of at least two map projections each from conical, cylindrical, and plane projection, Large to small scale map conversion, Data classification and Thematic Mapping, Map composite development, Assignment on misleading cartography, Visit to SOP, Seminar.

Recommended Text Books/Reference Books:

1. Baker, Thomas. (2005). Internet-Based GIS Mapping in Support of K-12 Education: The Professional Geographer 57 (1): 44-50.
2. Tang, Winnie, Jan and Selwood. (2003). Connecting Our World. Redlands, CA: ESRI Press: Redlands.
3. Peng, Zhong-Ren, Ming-Hsiang and Tsou. (2003). Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks. Hoboken, NJ: John Wiley & Sons: New York

GEO 485 - GIS SURVEYING & GPS TECHNOLOGY (3CH)

Pre-requisite: GEO 120

Objectives and learning Outcomes:

This course will focus on the acquisition of theory and practical field skills in geosciences. After studying this course, the students will be able to: learning the fundamentals and planning for surveying, its components, types and classification; Understand the procedure of surveying and functioning of different instruments used in surveying; Solve technical problems through practical applications

Course Content:

Introduction to Basic Concepts: Definitions, scope, evolution, current trends and future prospects of geodesy; Earth's shape & size, ellipsoid, its gravitational field and geoid; Units of measurement; surveying classification, Operations in Surveying: Triangulation, Trilateration, Traverse, establishment of ground control, mosaic, diagonal scale, surveying safety, units of measurement in surveying, zero-dimension in relation to different map scales, Theory of GPS & its working principles; errors in observations, precision & accuracy, least square adjustments Functions of Surveying Instruments: Tracking and data processing including GPS data display; Planimetric & vertical errors calculations; Distance measurement: Horizontal and vertical, Chain, Taping procedure its errors

Lab: Coordinate System conversion, GPS value reading; Easting Northing (latitude/ longitude) and elevation; Map Projections and Datum Settings; Adjustment of errors, compass sketch surveys; problems on whole circle bearing and quadrantal bearing; Topographic data capturing and mapping in ArcGIS.

Recommended Text Books/Reference Books:

1. Chang, K. T. (2010), "Introduction to Geographical Information Systems" Higher Education, McGraw-Hill
2. Ghilani, C.D and & Wolf, P.R.(2012) Elementary Surveying, an Introduction to Geomatics", 13thEdition
3. Clarke, K. (2010), "Getting started with Geographic Information System", 5th Edition, Prentice Hall, New York. ISBN –10: 0131494988
4. Gopi, S., Sathikumar, R., & Madhu, N. (2007). Advance SurveyingTotal Station, GIS and Remote Sensing. New Delhi, India: Dorling Kindersley

GEO 486 - MAPPING OF NATURAL RESOURCES (3CH)

Pre-requisite: GEO 305

Objectives and Learning outcomes:

This course is designed to provide concepts of different types of natural resources; Introduce different analytical, maping and modeling techniques for natural resource assessment; Apply remote sensing and GIS techniques for natural resource management. After completion of this course, the students will be able to: Understand the basics of natural resources, their importance with management perspective; Comprehend different techniques of remote sensing and GIS for management of natural resources.

Course Content:

Introduction to natural resources (Land, water and biodiversity) ; Watershed Hydrology; hydrological cycle and processes Different types of soils and properties (soil-water movement and Infiltration); Surface and groundwater characteristics and interaction ;Energy Resources, Spatial analysis tools for

natural resources management; Soil and water erosion (processes and assessment); Land and water resource management (Surface and Ground Water); Surface and groundwater quality assessment using geo-spatial techniques; Remote Sensing for mineral exploration; land cover monitoring (snow and glacier, natural vegetation, rangeland, etc) Geo-spatial modeling techniques in natural resource management (watershed, land, surface and groundwater).

Labs: Develop a variety of maps Land cover maps, vegetation maps, Forest mapping, soil maps, geology maps, coastal resource maps, water bodies maps, glacier and mountain ranges, etc using spatial data and GIS-based mapping software.

Recommended Text Books/Reference Books

1. Bipal K. Jana, Mrinmoy Majumder, Impact of Climate Change on Natural Resource Management, Springer (2010)
2. B.K. Jana (editor), M. Majumder (editor). 2010. Impact of Climate Change on Natural Resource Management: e-book. Springer. ISBN. 978-90-481-3581-3. Dordrecht.
3. Chapin, F.S., Kofinas, G.P., Folke, C. 2009. Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World. Springer; 1st Edition. ISBN-10: 038773032X. ISBN-13: 978-0387730325

GEO 490 - THESIS (6 CH)

Conduct research work in any field of interest related to Geosciences program being offered at BU and will require submission of a dissertation. At the end of the last semester & upon completion of research, FYP/Thesis will be submitted. The students will be required to defend Thesis/FYP along with comprehensive *viva voce* that would cover research as well as specialization material to the end of their academic program (8 semesters). The students result will be submitted to exam only after passing this *Viva voce* and will be included with Thesis defense. However, no separate grade will be assigned against *viva voce*.

AVAILABLE HUMAN RESOURCES

PERMANENT FACULTY MEMBERS			
S. No	Faculty Name	Designation	Qualification
1	<i>Dr. Syed Shahid Ali</i>	Professor / HOD	PhD Environ. Tox. Louisiana, USA
2	<i>Dr. Mehrab Khan</i>	Senior Professor	PhD Geology Univ. of Balochistan
3	<i>Dr. Haris Ahmed Khan</i>	Senior Assistant Professor	PhD Geophysics King Saud Univ. KSA
4	<i>Dr. Salma Hamza</i>	Senior Assistant Professor	PhD Geology (Geochem) Federal Urdu Univ.
5	<i>Ms. Shaista Iftikhar</i>	Senior Assistant Professor	MS Geophysics (Petro) Bahria Univ. Karachi
6	<i>Mr. Muhammad Jahangir Khan</i>	Assistant Professor	MS Geophysics (GIS & Seismology) BU

7	<i>Mr. Muhammad Irfan</i>	<i>Senior Lecturer</i>	<i>MS Geophysics (Hydro) Petronas, Malaysia</i>
STAFF FOR LABS			
8	<i>Mr. Ahsan Majeed Qureshi</i>	Senior Lab Engineer	MS Geophysics (Petro & Seismology)
9	Vacant - to be appointed	Lab. Assistant Geochemical Lab	BS Geology/GeoPhysics
10	Vacant - to be appointed	Lab. Assistant GIS& DGDL Labs	BS GIS/ Geology/Geophysics

LAB FACILITIES AT DEES

1. Geology Lab and Museum
2. Geochemical and Physical Analysis Lab
3. GIS & Remote Sensing Lab
4. Digital Geophysical Data Lab (DGDL) Computer Lab (Estb. PPL-Chair)

FINANCIAL SUPPORT & FACULTY REQUIREMENTS

- Existing Geophysics Faculty at BUKC-DE&ES with diverse specializations will offer courses and Research will be available
- Currently, no additional fund allocation is required except annual budget allocations for Dept. functioning.

**AMENDED FINAL TRANSCRIPT – DECLARATION OF SEMESTER RESULT OF PG STUDENTS UPON
SUBMISSION OF THESIS/ PROJECT WORK**

ISLAMABAD CAMPUS Master of Business Administration* Marketing FINAL TRANSCRIPT																																															
Student's Name : GHAZAN KHAN		Registration No : 55979 Enrollment No : 01-121181-009 Date of Admission : 06 February 2018 Mode of Study : Regular																																													
Father's Name : SHAH ROME Date Of Birth : 21 March 1994 CNIC/ Passport No : 16191-5890662-1																																															
Spring Semester 2018																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course Code</th> <th>Title</th> <th>Grade</th> <th>Grade Point</th> <th>Cr. Hours</th> <th>Product</th> </tr> </thead> <tbody> <tr> <td>FIN 611</td> <td>Corporate Finance</td> <td>F</td> <td>0</td> <td>3</td> <td>0</td> </tr> <tr> <td>MGT 600</td> <td>Contemporary Issues in Business</td> <td>A-</td> <td>3.67</td> <td>3</td> <td>11.01</td> </tr> <tr> <td>MGT 653</td> <td>Corporate Leadership & Social Responsibilities</td> <td>C</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>MGT 662</td> <td>Strategic Management</td> <td>B</td> <td>3</td> <td>3</td> <td>9</td> </tr> <tr> <td>MKT 655</td> <td>Services Marketing</td> <td>B-</td> <td>2.67</td> <td>3</td> <td>8.01</td> </tr> <tr> <td></td> <td></td> <td>GPA :</td> <td>2.27</td> <td>CGPA :</td> <td>2.27</td> </tr> </tbody> </table>						Course Code	Title	Grade	Grade Point	Cr. Hours	Product	FIN 611	Corporate Finance	F	0	3	0	MGT 600	Contemporary Issues in Business	A-	3.67	3	11.01	MGT 653	Corporate Leadership & Social Responsibilities	C	2	3	6	MGT 662	Strategic Management	B	3	3	9	MKT 655	Services Marketing	B-	2.67	3	8.01			GPA :	2.27	CGPA :	2.27
Course Code	Title	Grade	Grade Point	Cr. Hours	Product																																										
FIN 611	Corporate Finance	F	0	3	0																																										
MGT 600	Contemporary Issues in Business	A-	3.67	3	11.01																																										
MGT 653	Corporate Leadership & Social Responsibilities	C	2	3	6																																										
MGT 662	Strategic Management	B	3	3	9																																										
MKT 655	Services Marketing	B-	2.67	3	8.01																																										
		GPA :	2.27	CGPA :	2.27																																										
Fall Semester 2018																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course Code</th> <th>Title</th> <th>Grade</th> <th>Grade Point</th> <th>Cr. Hours</th> <th>Product</th> </tr> </thead> <tbody> <tr> <td>MGT 626</td> <td>Project Management</td> <td>F</td> <td>0</td> <td>3</td> <td>0</td> </tr> <tr> <td>MGT 655</td> <td>Business Decision Modeling</td> <td>F</td> <td>0</td> <td>3</td> <td>0</td> </tr> <tr> <td>MKT 635</td> <td>New Product Development</td> <td>C+</td> <td>2.33</td> <td>3</td> <td>6.99</td> </tr> <tr> <td>MKT 665</td> <td>Cases in Marketing</td> <td>B-</td> <td>2.67</td> <td>3</td> <td>8.01</td> </tr> <tr> <td>RMT 697</td> <td>Dissertation-I (Proposal Development)</td> <td>B+</td> <td>3.33</td> <td>2</td> <td>6.66</td> </tr> <tr> <td></td> <td></td> <td>GPA :</td> <td>1.55</td> <td>CGPA :</td> <td>1.92</td> </tr> </tbody> </table>						Course Code	Title	Grade	Grade Point	Cr. Hours	Product	MGT 626	Project Management	F	0	3	0	MGT 655	Business Decision Modeling	F	0	3	0	MKT 635	New Product Development	C+	2.33	3	6.99	MKT 665	Cases in Marketing	B-	2.67	3	8.01	RMT 697	Dissertation-I (Proposal Development)	B+	3.33	2	6.66			GPA :	1.55	CGPA :	1.92
Course Code	Title	Grade	Grade Point	Cr. Hours	Product																																										
MGT 626	Project Management	F	0	3	0																																										
MGT 655	Business Decision Modeling	F	0	3	0																																										
MKT 635	New Product Development	C+	2.33	3	6.99																																										
MKT 665	Cases in Marketing	B-	2.67	3	8.01																																										
RMT 697	Dissertation-I (Proposal Development)	B+	3.33	2	6.66																																										
		GPA :	1.55	CGPA :	1.92																																										
Spring Semester 2019																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course Code</th> <th>Title</th> <th>Grade</th> <th>Grade Point</th> <th>Cr. Hours</th> <th>Product</th> </tr> </thead> <tbody> <tr> <td>FIN 611</td> <td>Corporate Finance</td> <td>REPEAT F</td> <td>0</td> <td>3</td> <td>0</td> </tr> <tr> <td>MGT 626</td> <td>Project Management</td> <td>REPEAT B+</td> <td>3.33</td> <td>3</td> <td>9.99</td> </tr> <tr> <td>MGT 655</td> <td>Business Decision Modeling</td> <td>REPEAT B-</td> <td>2.67</td> <td>3</td> <td>8.01</td> </tr> <tr> <td>MKT 689</td> <td>Digital Marketing</td> <td>C</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td></td> <td></td> <td>GPA :</td> <td>2.00</td> <td>CGPA :</td> <td>2.49</td> </tr> </tbody> </table>						Course Code	Title	Grade	Grade Point	Cr. Hours	Product	FIN 611	Corporate Finance	REPEAT F	0	3	0	MGT 626	Project Management	REPEAT B+	3.33	3	9.99	MGT 655	Business Decision Modeling	REPEAT B-	2.67	3	8.01	MKT 689	Digital Marketing	C	2	3	6			GPA :	2.00	CGPA :	2.49						
Course Code	Title	Grade	Grade Point	Cr. Hours	Product																																										
FIN 611	Corporate Finance	REPEAT F	0	3	0																																										
MGT 626	Project Management	REPEAT B+	3.33	3	9.99																																										
MGT 655	Business Decision Modeling	REPEAT B-	2.67	3	8.01																																										
MKT 689	Digital Marketing	C	2	3	6																																										
		GPA :	2.00	CGPA :	2.49																																										
Fall Semester 2019																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course Code</th> <th>Title</th> <th>Grade</th> <th>Grade Point</th> <th>Cr. Hours</th> <th>Product</th> </tr> </thead> <tbody> <tr> <td>FIN 611</td> <td>Corporate Finance</td> <td>REPEAT B</td> <td>3</td> <td>3</td> <td>9</td> </tr> <tr> <td></td> <td></td> <td>GPA :</td> <td>3.00</td> <td>CGPA :</td> <td>2.77</td> </tr> </tbody> </table>						Course Code	Title	Grade	Grade Point	Cr. Hours	Product	FIN 611	Corporate Finance	REPEAT B	3	3	9			GPA :	3.00	CGPA :	2.77																								
Course Code	Title	Grade	Grade Point	Cr. Hours	Product																																										
FIN 611	Corporate Finance	REPEAT B	3	3	9																																										
		GPA :	3.00	CGPA :	2.77																																										
Thesis/Internship/CSP																																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course Code</th> <th>Title</th> <th>Grade</th> <th>Grade Point</th> <th>Cr. Hours</th> <th>Product</th> </tr> </thead> <tbody> <tr> <td>SDW 496</td> <td>Internship Completed on 15 May 2019</td> <td>A-</td> <td>3.67</td> <td>0</td> <td>0</td> </tr> <tr> <td>RMT 698</td> <td>Dissertation II (Thesis Write-up & Defense) Completed on 10 July 2019</td> <td>A-</td> <td>3.67</td> <td>4</td> <td>14.68</td> </tr> <tr> <td></td> <td>Overall Percentage :</td> <td>72.2</td> <td>GPA :</td> <td>3.67</td> <td>CGPA :</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2.87</td> </tr> </tbody> </table>						Course Code	Title	Grade	Grade Point	Cr. Hours	Product	SDW 496	Internship Completed on 15 May 2019	A-	3.67	0	0	RMT 698	Dissertation II (Thesis Write-up & Defense) Completed on 10 July 2019	A-	3.67	4	14.68		Overall Percentage :	72.2	GPA :	3.67	CGPA :						2.87												
Course Code	Title	Grade	Grade Point	Cr. Hours	Product																																										
SDW 496	Internship Completed on 15 May 2019	A-	3.67	0	0																																										
RMT 698	Dissertation II (Thesis Write-up & Defense) Completed on 10 July 2019	A-	3.67	4	14.68																																										
	Overall Percentage :	72.2	GPA :	3.67	CGPA :																																										
					2.87																																										
36 Credit hours Completed. * The Program consists of 36 credit hours, duration 1.5 years. I Relevant semester result of the student is to be considered in conjunction with the Thesis/ Project result finalised in the same semester. Print Date : 21 July 2020																																															
Program completion date: 27 January 2020 Controller of Examinations																																															

APPROVED AMENDMENT - BUAR CHAPTER 9**Chapter 9 - HONOURS AND AWARDS****9.1 Preamble**

Students achieving high academic standards will be awarded Academic Honours (Medals and Honour/ Merit/ Distinction Certificates) upon completion of their degree requirements at the Convocation Ceremony. In addition, Merit Scholarships, Financial Assistance Scholarships and a Mention in the Rector's Honours List are the Honours conferred during the course of studies. Cum Laude Honors will be recorded on the Transcript.

9.2 Baseline Eligibility Criteria for Honours & Awards

A student shall be eligible for an Academic Honour/Award if he/ she:

- 9.2.1.1 Has completed the programme within the Regular programme duration, as defined in Table 2 of Chapter 3 of these Rules.
- 9.2.1.2 Has taken full semester/ annual load for the entire degree programme (as applicable) without having withdrawn or repeated any course prescribed for any semester;
- 9.2.1.3 Has scored a minimum 3.5 CGPA (for semester based programs)/ 70% total marks (for annual based programs) for award of a medal.

9.3 Baseline Ineligibility Criteria for Honours & Awards

- 9.3.1.1 Does not have any incomplete credit hours.
- 9.3.1.2 Does not have any Credit Transfer (excluding transfer from one CU of the BU to another)/ Migration or Summer Semester Course (except Courses under approved regular programs) to his/ her credit².
- 9.3.1.3 Has never been penalized in any disciplinary case at the University;
- 9.3.1.4 Has submitted the finalized Thesis/ Final Year Project beyond the regular timeline; clause 9.4.1.4 and 9.4.1.5 refer.

9.4 Conditions for Medals

- 9.4.1 Subject to the Rules at clause 9.2 and 9.3, graduates shall be awarded Gold and Silver medals as enunciated below:

9.4.2 Semester Based Programs

- 9.4.2.1 Gold and Silver medals will be awarded to the students who achieve First and Second highest CGPA respectively, within the same batch.
- 9.4.2.2 Where two or more students have the same highest CGPA, the Percentages achieved by them will determine the Gold and Silver medals. If the percentages are also the same, then all the students will be awarded Gold Medals. In such a case no Silver Medal will be awarded.
- 9.4.2.3 In a double tie (same CGPA and Percentage) situation for Silver medal between two or more

² There may be exceptions to this Rule provided the exceptions are duly approved by the BU Academic Council.

students, all the students will be awarded the Silver Medal.

9.4.2.4 MS/ MPhil students are to submit their Thesis to respective Department by the end of 2nd week of the next semester. Departments are to subsequently submit the result of each student's Thesis by the end of week-10 into the next semester. Students completing their Thesis within this time period shall be eligible for honors and awards, and shall not be charged any fee for the 10 x weeks into the next semester.

9.4.2.5 Duration of Thesis/ Project for MBA programs shall be one semester. Open defence shall normally be held in 3rd week after completion of the final examination of the previous semester. Students completing their Thesis/ Project within this time period shall be eligible for honors and awards.

9.4.3 Annual Programs

9.4.3.1 Gold Medals will be awarded to the students scoring highest percentages in the Final Professional Examinations based on aggregate percentage of all Professional Examinations. The students getting second highest aggregate marks will be awarded Silver Medals.

9.4.3.2 Where two or more students have the same highest percentage, then all the students will be awarded Gold Medals. In such a case, no Silver Medal will be awarded.

9.4.3.3 In a tie situation for Silver medal between two or more students, all the students will be awarded the Silver Medal.

9.5 Conditions for Honour/ Merit/ Distinction Certificates

9.5.1 **Honour Certificates.** Subject to the rules at clause 9.2 and 9.3, graduates scoring a minimum of 3.6 CGPA upon completion of respective program shall be awarded Cum Laude Honours as per following categories:

Honour	CGPA Requirement
Summa Cum Laude	≥ 3.90
Magna Cum Laude	≥ 3.80 to < 3.90
Cum Laude	≥ 3.60 to < 3.80

9.5.2 **Merit Certificates.** Students completing the annual programs (MBBS/ BDS) and scoring highest percentage in different Professional subjects will be awarded Merit Certificates, as per policy determined by the respective institutes/ colleges.

9.5.3 **Certificate of Distinction.** Students of MBBS/ BDS programs obtaining 80% or above marks in a specific subject may be awarded Certificate of Distinction in that subject.

9.6 Rector's Honours List

In every semester/ year, students achieving CGPA 3.9 or more (semester based programs)/ 80% or more total marks (annual based programs) will be included in the Rector's Honours List for corresponding semester/ year, followed by displaying the Honours List on BU website and Campus Notice Boards.

APPROVED AMENDMENT – BUAR CHAPTER 3 TABLE 2

Programmes Duration

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)
BBA	2.0	3.0	
LLB	5.0	7.5	as per Accreditation Authority Rules
MBBS	5.0		
BDS	4.0		
DPT	5.0	7.5	1 year (by Rector)
MBA & MS	1.5	3.0	
MBA, MS, MPhil & LLM	2.0	3.0	
PhD	3.0	6.0	2 years (1 st year by the FRC; 2 nd year by the Rector)

Bahria University, Islamabad
Department of Humanities & Social Sciences

Course Name	Foreign Policy of United States	Prepared On	Fall 2019			
Course Code	IRS 539					
Credit Hours	3	Revised On	Spring 2019			
Course pre-req	None					
Course Type	Elective					
Program	MS (IR)					
Semester						
Instructor:	Irfan Qaisrani					
Course Description						
This course introduces the study and practice of American foreign policy. The course is divided into three parts. First part is historical background (1776-1990), second part is post-cold war issues and challenges (1990-2000) and last one is the American foreign policy during 21th century.						
Course Learning Outcomes						
CLO	Description					
To familiarize with the basics of American foreign policy through understanding historical perspectives, trends of American foreign policy and the scope of American foreign policy in 21th century. With practical and theoretical background, student will be able to understand contemporary American Foreign Policy and make informed predictions about the future of international politics.						
Teaching & Learning Methodology						
Formal lectures, use of multimedia, interactive session and class participation.						
Textbook(s)						
▪ Reading pack.						
Grading Policy						
	Assessment Instruments	Percentage				
	Quizzes and Assignments	30 %				
	Mid Term Exam	30 %				
	Final Exam	40 %				

Week-wise Course Outline		
Week/ Session	Content	Learning/ Objectives Addressed/ Mandatory readings
1	Introduction - course outline.	Foundation of American foreign policy. Isolationism, Moralism and Pragmatism. The American Outlook pp. 169-208
2	Topics: The Goals of American Foreign Policy in Historical Perspective: 1776-1941, 1946-1989, from Berlin wall to 9/11 and beyond	History of US foreign Policy. Wittkopf, Jones and Kegley pp. 29-74

3	Topics: The New World Order and Two Great Traditions: Theodore Roosevelt Or Woodrow Wilson	World orders and 20 th century. H. Kissinger pp. 17-28, pp. 29-55
4	Topic: The Structure of The International System Bipolar and Multipolar System Topic: Pre-theories and Theories of Foreign Policy	Structure of the world. Kenneth N. Waltz pp. 98-105 pp. 91-97 James N. Rosenau pp. 27-92
5	Topic: Post Cold war paradigms. Sub-topic: What Should Be A New World Order? The End of History? And Clash of Civilization?	Post-Cold War Issues and Challenges. Joseph Nye, Francis Fukuyama and Samuel P. Huntington
6	Topic: Why We Will Soon Miss the Cold War? Coming Anarchy?	John Mearsheimer and Robert D. Kaplan
7	Topic: Hegemonic Stability theory Democratic Peace Theory The Defense Planning Guide (DPG) and Project for New American Century (PNAC)	Declassified/Official documents
8	Topic: Bush Administration Sub-topic: Grand Strategy Response to Terrorism	Foreign Policy in 21st Century. John Ikenberry: America's Imperial Ambition.
9	Topic: Continues... Afghanistan war and Iraq war	John Lewis Gaddis: Grand strategy in Second term
10	Topic: Nationalism Sub-topic: Paradoxes of American Nationalism Political Interest Group such as Neo-Cons.	Mexi Pei Max Boot: Neo-Cons
11	Topic: Israel Lobby and US foreign Policy	Role of Lobbies in US foreign Policy decision making process. John Mearsheimer
12	Topic: Obama Administration Sub-topic: Obama Speech	Obama Speech 2009
13	Topic: Continued.	NSS 2010.
14	Topic: Totality of American Foreign Policy. Four traditions; Hamiltonianism, Jeffersonianism, Wilsonianism and Jacksonianism.	US foreign policy traditions. Walter Russell Mead: Special Providence
15	Topic: Comparison with different Empires In History of International Relations.	America As Empire in 21st century.
16	Review and conclusion of course outline	No reading.

Guidelines

This course outline is a working outline for our semester. It is your responsibility to read everything stated in this document and meet all the requirements in order to complete the course successfully. If you do not read the whole course outline and meet the requirement entailed therein, you will take the responsibility for any penalty, e. g., fail grade misunderstanding, misinformation, or anything that may impact your grade.

CURRICULUM OF INTERNATIONAL RELATIONS**FOR BS, MS and PhD 2018****HIGHER EDUCATION COMMISSION****ISLAMABAD****SCHEME OF STUDIES FOR MS (2 -3 YEARS) IN INTERNATIONAL RELATIONS**

Semester	Name of Subject	Credits
First	International Relations: Advanced Theory and Practice	3
	Advanced Research Methodology	3
	Traditional and Non-traditional Security Paradigms	3
	OPTIONAL-I	3
	Total	12
Second	OPTIONAL-II	3
	OPTIONAL-III	3
	OPTIONAL-IV	3
	OPTIONAL-V	3
	Total	12
Semester	Name of Subject	Credits
Third and Fourth	Thesis/Dissertation	6

Bahria University, Islamabad**Faculty Name: Saira Nawaz Abbasi****Department of Humanities & Social Sciences****COURSE OUTLINE**

Course Name	Traditional & Non-traditional Security Paradigms	Prepared on	Fall 2019
Course Code	IRS 504		
Credit Hours	3		
Course Prerequisite	Nil		
Prerequisite Code	Nil	Revised on	As per Requirement
Course Type	<input type="checkbox"/> Core Course		
Program	<input type="checkbox"/> MS - IR		
Semester	Fall 2019		

Course Description

The course aims to offer a detailed review of traditional and non-traditional security paradigms. The course will cover the current debates on the concept of security, causes of war, strategies, methods and practices. In addition to that non-security issues which states are confronting in the current arena of international politics will be thoroughly discussed. In the 21st century the rise of non-state actors, intensification of intra state conflict, degeneration of the environment, seeping demographic changes and the rapidly flourishing cyber warfare arena have replaced inter-state wars as the major threats to nation's security in the 21st century.

Course Learning Outcomes

CLO #	Description
1.	Upon successful completion of the course, the scholars will be able to: - Understand key concepts, theories, and explanations of international security.
2.	Demonstrate a comprehension of the idea of security and its relevance to policy.
3.	Highlight the challenges to international and national security.
4.	Understanding the non-traditional security issues pertaining to states in the 21 st century.
5.	To be able to prescribe recommendation to states in order to deal with traditional and non-traditional security threats.

Teaching & Learning Methodology

Following tools would be utilized during the course of semester to develop the understanding of the core concepts of traditional and non-traditional security threats as well as the research skills.

1. Review of the book related to traditional and non-traditional security paradigms.
2. Seminar Activity – Students prepare a talk on a given topic
3. Quiz
4. Research Essay
5. Research Presentation

Text Book and References**Text Book:**

Course Pack & Class Hand-out

Reference Books:

- Barry Buzan, *The Evolution of International Security Studies* (Cambridge: Cambridge University Press, 2009).
- Brahma Chellaney, *Water: Asia's New Battleground* (Washington, DC: Georgetown University Press, 2011).
- John Mueller, *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al Qaeda* (Oxford: Oxford University Press, 2010).
- Mely Caballero-Anthony, *Introduction to Non-Traditional Security Studies A Transnational Approach* (New Delhi: Sage, 2016).
- Michael R. Chambers, *South Asia in 2020: Future Strategic Balances and Alliances* (Carlisle, Pennsylvania: Strategic Studies Institute, U.S. Army War College, 2003).
- Paul D'Anieri, *International Politics: Power and Purpose in Global Affairs* (Singapore: Wadsworth, 2012).
- Paul Williams, *Security Studies: An Introduction* (Abingdon, Oxford: Rutledge, 2008).
- Robert J. Art and Kenneth N. Waltz, *The Use of Force: Military Power and International Politics*, 6th ed. (Lanham, M.D.: University Press of America, 2004).

Grading Policy

Assessment Instruments	Percentage
Quizzes	15%
Assignments	20%
Mid Term Exam	25%
Final Exam	40%

Week-wise Course Outline

week / Session	Contents	Activities / Learning Outcome
1.	Conceptualizing Security and Perception of Threat	<ul style="list-style-type: none"> - Defining security according to three level of analysis - Factors of threat perception emanating from other states
2	Traditional Security: Paradigm of State Security	<ul style="list-style-type: none"> - Issues of war and peace - How to achieve peace according to realism and liberalism - External threats to the security of state - Regional and international sources of threats to state's security
3	Traditional Security Strategies <ul style="list-style-type: none"> - Power Distributions - Power Transitions 	<ul style="list-style-type: none"> - Students should be able to understand the concept of polarity in the international structure. Who are great powers, major powers and smaller states? - The rise and fall of states due to traditional and non-traditional security issues will be elaborated through various case studies.
4	<ul style="list-style-type: none"> - War - Deterrence - Arms Control & Disarmament 	<ul style="list-style-type: none"> - When and how wars occur between the states?

		<ul style="list-style-type: none"> - How war can be avoided with the help of nuclear capability. - How nuclear weapons could pose a threat to international peace and security i.e. nuclear flash point.
5	<ul style="list-style-type: none"> - Anarchy - Stability 	<ul style="list-style-type: none"> - The anarchical nature of international system - Absence of central authority at international level and its implications - Factors to enhance international and national stability
6	Non-Traditional Security Paradigm <ul style="list-style-type: none"> - Constructive security - Human security 	<ul style="list-style-type: none"> - Theoretical understanding of non-traditional security paradigm.
7	<ul style="list-style-type: none"> - Copenhagen School - Post-Structural Security 	<ul style="list-style-type: none"> - Theoretical understanding of non-traditional security paradigm.
8	<ul style="list-style-type: none"> - Feminist Security - Critical Security 	<ul style="list-style-type: none"> - Theoretical understanding of non-traditional security paradigm.
9	MID-TERM EXAMS	
10	<ul style="list-style-type: none"> - Post-Colonial Security - Peace Education - Securitization 	<ul style="list-style-type: none"> - Theoretical understanding of non-traditional security paradigm.
11	Non-Traditional Security Challenges/ Issues	<ul style="list-style-type: none"> - Issues of non-traditional security threats to national security. - Significance of non-traditional security for the progress of state.
12	<ul style="list-style-type: none"> - Terrorism - Environmental degradation/ Climate Change 	<ul style="list-style-type: none"> - Rise of non-state actors - Illegal use and threat of use of violence - International political ecology
13	<ul style="list-style-type: none"> - Water Security - Energy Security 	<ul style="list-style-type: none"> - Case study of Indo-Pak water dispute - Energy crisis and effects on the economy
14	<ul style="list-style-type: none"> - Financial crises/ economic security - Health 	<ul style="list-style-type: none"> - Significance of economic prosperity for the security and development of the state. - Significance of health for the security of a state.
15	<ul style="list-style-type: none"> - Illegal Immigration - Transnational Crimes 	<ul style="list-style-type: none"> - Concept of trans-nationalism and its effects on national and international security.
16	Completion of Syllabus Revision	Teacher will take test and clear all queries regarding outline topics.
17	Revision and Quiz over whole syllabus after Mid term	Resolve the student's queries through question, answer session.
18	FINAL EXAMS	

Note:-

- Student's preparations for case studies and participation in discussions can be selectively taken as their assignments for grading or instructor may develop separate mechanism.
- Class activities would predominantly include discussions, developing role models by the students, presentations by student groups and case studies.

Appendage 3522**Bahria University, Islamabad****Faculty Name: Saira Nawaz Abbasi****Department of Humanities & Social Sciences****COURSE OUTLINE**

Course Name	Nuclear Security and Non-Proliferation	Prepared on	Fall 2019
Course Code	IRS 420		
Credit Hours	3		
Course Prerequisite	Nil		
Prerequisite Code	Nil	Revised on	As per Requirement
Course Type	<input type="checkbox"/> Core Course		
Program	<input type="checkbox"/> BS – IR		
Semester	Fall 2019		

Course Description

The course aims to introduce students with the fundamentals of nuclear physics and its significance for international relations at large. Nuclear security issues are related to the prevention and detection of theft, sabotage, and unauthorized access, illegal transfer of nuclear and other radioactive material. With the expansion of the demand of nuclear energy, possible malicious activities involving nuclear and material has become an important concern of the international community. Hence; this course will also highlight the dividends and challenges associated with the continuous spread of nuclear energy and the possible ways to deal with it.

Course Learning Outcomes

CLO #	Description
1.	Upon successful completion of the course, the students will be able to: - Comprehend the intricate linkage that International politics has to nuclear studies, and to explain the causes for rising demand and spread of nuclear energy.
2.	Critically examine the forces that have politicized nuclear studies for garnering certain leverages vis-à-vis others.
3.	Rationalize and propose the best possible options for tapping the full potential of nuclear energy for peaceful purposes, while effectively limiting the destructive tendencies associated with this renewable source of energy.
4.	Understanding the issues of proliferation as well as the international mechanisms in place to encourage non-proliferation.

5.	To understand the significance of nuclear security and nuclear security culture.			
Teaching & Learning Methodology				
Following tools would be utilized during the course of semester to develop the understanding of the core concepts of nuclear security and non-proliferation as well as the research skills.				
<ul style="list-style-type: none"> 6. Review of the article related to nuclear security. 7. Seminar Activity – Students will prepare a talk on a given topic related to the subject. 8. Quizes 9. Research Essay 10. Research Presentation 				
Text Book and References				
<p>Text Book: Course Pack & Class Hand-out</p> <p>Reference Books:</p> <p>Ian Hore-Lacy, Nuclear Energy in the 21st Century (London: World Nuclear University Press, 2012).</p> <p>Benjamin K. Sovacool and Scott Victor Valentine, The National Politics of Nuclear Power: Economics, Security and Governance (New York: Rutledge, 2012).</p> <p>Fred Mc Goldrick, Nuclear Trade Controls: Minding the Gaps (Washington D. C.: Centre for Strategic and International Studies, 2013). 50</p> <p>Geoffrey Rothwell, Economics of Nuclear Power (New York: Rutledge, 2016).</p> <p>W.C. Potter, International Nuclear Trade and Nonproliferation (United States: Lexington Books, D C Heath and Co. 1990).</p>				
Grading Policy				
	Assessment Instruments	Percentage		
	Quizzes	15%		
	Assignments	20%		
	Mid Term Exam	25%		
	Final Exam	40%		
Week-wise Course Outline				
week / Session	Contents	Activities / Learning Outcome		
1.	Introduction to Nuclear Physics and dual use of Nuclear Energy	<ul style="list-style-type: none"> - Providing core concepts of nuclear physics in order to understand the significance of protecting nuclear material. - How nuclear technology is significant for non-military purposes as well. 		

2	Nuclear Fuel Cycle: Inputs Processes and Outputs	- Industrial processes involve that prepare uranium for use in nuclear reactors.
3	Evolution and Spread of Nuclear Technology - Atoms for Peace and IAEA - NPT	- The dawn of nuclear age was 1945 - How the world and the concept of warfare has been transformed. - Concerns of international community to prevent the spread of nuclear technology for military purposes. - Nuclear non-proliferation Treaty
4	Evolving Peaceful Uses of nuclear Technology	- States can acquire nuclear technology for the peaceful purposes. - What are the peaceful purposes of nuclear technology?
5	Nuclear Security Overview	- How security is implemented at nuclear facilities - Defence in depth, multi-person rules and principle of least leverage.
6	Physical Protection of Nuclear Material and Nuclear Facilities	- Overview of IAEA standards of protection off nuclear material and commercial nuclear facilities.
7	Nuclear Security Culture Overview	- Implication of institutional security culture - How it may either adversely affect security at nuclear installations?
8	Nuclear Security Culture Case Studies	- Overview off several case studies where institutional security has positively or negatively influenced security risks at facilities.
9	MID-TERM EXAMS	
10	Insider Threats to Nuclear Facility	- How insider threats may affect facility security? - How they may be detected? - How to protect against them through technical and administrative means.
11	Case Studies of Insider Treats to Nuclear Security	- Overview of several cases where insiders have breached institutional security, their methods and responses to mitigate them.
12	Vulnerability Assessment Tools	- Discuss how vulnerability assessment tools work, their practical application to physical security. - How they may be used to lessen security risks?

13	Fundamentals of Cyber Security and Best Practices - Case Studies of Cyber Security - IAEA Perspective on Nuclear Security	- Basic elements of cyber security - How networked systems are vulnerable and may be protected.
14	Nuclear-related trade in the age of Evolving threats - Global Initiatives for regulating Nuclear trade - Significance of National/Domestic legislation - Integrating the National- International export-regulating frameworks - Multilateral approaches to Fuel Cycle - Nuclear Safety and Security	- Why there is a need to have law at state level to protect and prevent the transfer of nuclear technology to other states or actors which could be grave security risk at the global level.
15	Need for Nuclear Disarmament: Critical Appraisal of the NNPR	- Significance of nuclear free world. - Critical evaluation of nuclear non-proliferation regime in place.
16	Completion of Syllabus Revision	Teacher will take test and clear all queries regarding outline topics.
17	Revision and Quiz over whole syllabus after Mid term	Resolve the student's queries through question, answer session.
18	FINAL EXAMS	

Note: -

- Student's preparations for case studies and participation in discussions can be selectively taken as their assignments for grading or instructor may develop separate mechanism.
- Class activities would predominantly include discussions, developing role models by the students, presentations by student groups and case studies.

ISLAMIC STUDIES COURSE OUTLINE

Course Name	Islamic Studies	Prepared	
Course Code	ISL 101 and ISL 201	Fall 2019	
Credit Hours	03		
Course Pre Requisite	Nil		
Course Pre Req. Code	Nil	Revised Spring 2020	Approved Spring 2020
Course Type	Core Course		
Program	BS / BBA		
Semester	2020		
Course Objective			
To make students proud of Islamic heritage and motivate them to become good practicing Muslims.			
Course Description			
The course introduces students to the Holy Quran and Sunnah. It also includes Quranic Arabic vocabulary and basic grammar. This course provides insight about Deen, Ibadah, and Halaal o Haraam. Selected verses from the Holy Quran and Hadeeth have been included. It also includes brief history of Prophet PBUH and impact of his life on humanity. It includes the significance and importance of Muslim scientists and their role in various scientific fields. The course will give a clear vision to students regarding economic, political, and social system of Islam. The designed course also encompasses the topic of Islamic culture and civilization.			
Course Learning Outcomes			
Description			
Upon completion of the course, students will be able to:			
<ol style="list-style-type: none"> Understand with clarity the Islamic concepts in the guidance of the Holy Quran and Sunnah Understand the Islamic Ideology and its deep link with our lives. Understand the way of Islam: Beliefs and practices. Develop creative and innovative attitude. Develop ethical behavior in social and professional work environments. Understand Salah (Namaz) and Duas (Azkaar), as required in connection with our daily lives. Demonstrate an appropriate understanding of basic Arabic grammar. Learn important teachings, decisions and actions of Prophet Muhammad PBUH in Makkah and Madinah. Identify the contribution of Muslim Scientists towards various fields of sciences and their important achievements. Understand the significance of health, obedience of Law and other basic necessities of human life so that He / She may become a responsible citizen. 			
Teaching and Learning Methodology			
<ol style="list-style-type: none"> Lectures demonstration Handouts Use of multimedia Group discussions Presentations Internet resource materials Assignments and quizzes 			
Textbook(s)			

Notes will be furnished by the teachers and approved by the Center of Islamic Studies.
--

Reference Book(s)

1. "Tafseer e Usmani" by Maulana Shabbir Ahmad Usmani
2. "Tafheem ul Quran" by Syed Abul Ala Maudoodi
3. "Zia ul Quran" by Peer Karam Shah Al-Azhari
4. "Tafseer e Kausar" by Allama Sheikh Mohsin Ali Najfi
5. "Riaz al Saliheen" (English Translation) by Imam Novi
6. "Insan e Kamil" (انسان کامل) by Dr. Syed Khalid Alvi
7. "The Sealed Nectar" (الرَّحْقُ الْمُخْتَومُ) by Maulana Safi ud din Mubarakpuri
8. "Zia ul Nabi PBUH" by Peer Karam Shah Sahab Al-Azhari
9. "The Reconstruction of Religious Thought in Islam" by Allama Muhammad Iqbal
10. "Islam Kya Hai" (اسلام کیا ہے) by Maulana Sadar ud din Islahi
11. "Islami Nazriya Hayat" by Prof. Khursheed Ahmad
12. "Principles of Islamic Jurisprudence" by Ahmad, H. (1993), IRI, IIUI
13. "Emergence of Islam" by Hameedullah, Muhammad. (1993). IRI, IIUI
14. "An Introduction to the Study of Islamic Law" by Hussan, H. (2007). Leaf publications
15. "Muslim Jurisprudence and the Quranic Law of Crimes" by Mir, W. (1982). Islamic Book Service
16. "Islamic Studies" by Prof. Mufti Munib-ur-Rehman, Karachi

Grading Policy

Assessment Instruments	Percentage
Quizzes	15 %
Assignments	10 %
Presentation	10 %
Mid Term Exam	25 %
Final Exam	40 %

Week Wise Course Outline (Islamic Studies)

Week	Contents
1.	Introduction to Sources of Islam <ol style="list-style-type: none"> a. Introduction and basic Concepts of Al-Quran b. Introduction of Sunnah, Hadeeth, History, Kinds of Hadith
2.	<ol style="list-style-type: none"> a. Concept of Deen (تصویر دین) in the light of Quran and Sunnah b. Study of selected text on Aqaid, Ibadat, Muamlat, & Akhlaq from Holy Quran c. Verses of Surah Al-Baqra Related to Faith (Verse No-284-286) d. Quranic Language (QL) "Hua, Hia, Anta, Anti" هُو ، هٰي ، أَنٰت ، أَنٰتِ
3.	<ol style="list-style-type: none"> a. Concept of Ibadat in Islam (اسلام کا تصور عبادت) b. Study of selected text from Holy Quran; Surat ul Baqra verse 177 c. Quranic Language (QL) "Anna, Nahnu" أَنَا ، نَحْنُ
4.	Seerat (سیرت) of Holy Prophet (S.A.W)-I <ol style="list-style-type: none"> a. Important Lessons Derived from the life of Holy Prophet in Makkah b. Basic Quranic Teachings of Adab-e-Nabi relate to Surat Al-Ahzab (Verse: 21, 40, 56-57) Quranic Language (QL) "Hu, Haa, Hum" هُو ، هٰا ، هُم

5.	<p>Seerat (سیرت . مدنی دور) of Holy Prophet (S.A.W) –II</p> <ul style="list-style-type: none"> a. Important Events with Lessons Derived from the life of Holy Prophet (S.A.W) in Madina b. Quranic Teachings of Adab Al-Nabi related to Surat Al Hujrat Verse 1-3 Quranic Language (QL) "Hum, Haza, Zaalika, Ullaika" هم , هذَا ، ذلِكَ ، اولنک
6.	<p>(اسلام کا تصور حلال و حرام)</p> <ul style="list-style-type: none"> a. Basic concept of Halal and Haram b. Study of selected text of Al-Quran verses of Surat Al Anaam. Verse 151, Surat Al Araf verse 32 Quranic Language (QL) Past Tense "kattaba, Jalasa, Dakhalla, Kharaja, Nazara, فعل ماضی - کتب - جلس - دخل - خرج - نظر etc."
7.	<p>(اسلام کا سیاسی نظام)</p> <ul style="list-style-type: none"> a. Basic Concepts of Islamic Political System b. Basic Institutions of Govt. in Islam c. Significant features of Riyasat e Madeena (ریاست مدینہ), Surat Al Hadid verse 25 Quranic Language (QL) Verbs with pronouns "Ta, Tii, Woo (For Plural)" الأفعال مع الضمائر- کتبت- کتبوا
8.	<p>(اسلام کا نظام عدل)</p> <ul style="list-style-type: none"> a. Basic Concepts of Islamic Law & Jurisprudence b. Sources of Islamic Law & Jurisprudence c. Nature of Differences in Islamic Law Quranic Language (QL) Verbs Muddarei "Yaktubu, Yajlissu, Yadkhullu, Yakhruju, Yanzuru, Yasmaau etc." فعل مضارع - یكتب - یجلس - یدخل - یخرج - ینظر - یسمع
9.	MID-TERM EXAMS
10.	<p>(اسلامی تہذیب و ثقافت)</p> <ul style="list-style-type: none"> a. Basic Concepts of Islamic Culture & Civilization b. Islamic Culture & Civilization and Contemporary Issues Quranic Verses Surat ul Aaraf 26, 27, & 28. Quranic Language (QL) Verbs Muddarei "Yaktubu, Taktuubu, Akubu, Naktabu" فعل مضارع - یكتب - تکتب - اکتب - نکتب
11.	<p>(اسلام اور سائنس)</p> <ul style="list-style-type: none"> a. Basic Concepts of Islam & Science b. Contributions of Muslims in the Development of Science Quranic Language (QL) Verbs Muddarei "ون" (For Plural) "Yaktubuna" فعل مضارع - یکتبون
12.	<p>(اسلام کا معاشی نظام ۱)</p> <ul style="list-style-type: none"> a. Basic Concepts of Islamic Economic System b. Means of Distribution of wealth in Islamic Economics Islamic Concept of Riba Quranic Language (QL) Ism Faa'il "Katib, Qatil, Hakim etc." اسم فاعل - کاتب . قاتل - حاکم... ..
13.	<p>(اسلام کا معاشی نظام ۲)</p> <ul style="list-style-type: none"> a. Islamic Banking & Finance b. Islamic ways of Trade and Commerce Quranic Language (QL) Ism Ma'kul "Maktub, Maqtul, Mahkum etc."

 اسم مفعول - مكتوب - مقتول - محکوم
14.	<p>(اسلام کا معاشرتی نظام۔۱) Social System of Islam</p> <ul style="list-style-type: none"> a. Basic Concepts of Social System of Islam b. Elements of Family c. Human Rights in Islam <p>دعاء صلاة – رب اجعلني مقيم الصلاة من ذريتي ربنا و تقبل دعاء ربنا اغفرلي و لوالدي و للمؤمنين يوم يقوم الحساب فعل أمر – اكتب – ادخل ۔ اخرج Quranic Language (QL) Fael Amr</p>
15.	<ul style="list-style-type: none"> a. Ethical Values of Islam (الأخلاقيات) b. Description with Verses of Surah Hujrat 6-9-10-11-12 c. Description in the light of Hadith <p>فعل نهي – لا تكتب – لا تخرج – لا تنظر Quranic Language (QL) Fael Nahi</p>
16.	<p>(اسلام اور غیر مسلم معاشرے) Relations with Non-Muslims</p> <ul style="list-style-type: none"> a. In the light of Quran and Sunnah b. Surah Aal-e-Imran, verse 64 <p>Quranic Language (QL) Revision With Dua</p>
17.	REVISION
18.	FINAL EXAMS

ISLAMIC STUDIES COURSE OUTLINE

Course Name	Islamic Studies	Prepared		
Course Code	ISL 101	Fall 2019	Approved Spring 2020	
Credit Hours	02			
Course Pre Requisite	Nil			
Course Pre Req. Code	Nil			
Course Type	Core Course	Revised Spring 2020		
Program	BS Engineering Sciences			
Semester	2020			
Course Objective				
To make students proud of Islamic heritage and motivate them to become good practicing Muslims.				
Course Description				
The course introduces students to the Holy Quran and Sunnah. It also includes Quranic Arabic vocabulary and basic grammar. This course provides insight about Deen, Ibadah, and Halaal o Haraam. Selected verses from the Holy Quran and Hadeeth have been included. It also includes brief history of Prophet PBUH and impact of his life on humanity. It includes the significance and importance of Muslim scientists and their role in various scientific fields. The course will give a clear vision to students regarding economic, political, and social system of Islam. The designed course also encompasses the topic of Islamic culture and civilization.				
Course Learning Outcomes				
Description				
Upon completion of the course, students will be able to:				
<ol style="list-style-type: none"> Understand with clarity the Islamic concepts in the guidance of the Holy Quran and Sunnah Understand the Islamic Ideology and its deep link with our lives. Understand the way of Islam: Beliefs and practices. Develop creative and innovative attitude. Develop ethical behavior in social and professional work environments. Understand Salah (Namaz) and Duas (Azkaar), as required in connection with our daily lives. Demonstrate an appropriate understanding of basic Arabic grammar. Learn important teachings, decisions and actions of Prophet Muhammad PBUH in Makkah and Madinah. Identify the contribution of Muslim Scientists towards various fields of sciences and their important achievements. Understand the significance of health, obedience of Law and other basic necessities of human life so that He / She may become a responsible citizen. 				

Teaching and Learning Methodology													
1.	Lectures demonstration												
2.	Handouts												
3.	Use of multimedia												
4.	Group discussions												
5.	Presentations												
6.	Internet resource materials												
7.	Assignments and quizzes												
Textbook(s)													
Notes will be furnished by the teachers and approved by the Center of Islamic Studies.													
Reference Book(s)													
1. "Tafseer e Usmani" by Maulana Shabbir Ahmad Usmani 2. "Tafheem ul Quran" by Syed Abul Ala Maudoodi 3. "Zia ul Quran" by Peer Karam Shah Al-Azhari 4. "Tafseer e Kausar" by Allama Sheikh Mohsin Ali Najfi 5. "Riaz al Saliheen" (English Translation) by Imam Novi 5. "Insan e Kamil" (انسان کامل) by Dr. Syed Khalid Alvi 6. "The Sealed Nectar" (الرَّحْمَنُ الْمُخْتَومُ) by Maulana Safi ud din Mubarakpuri 7. "Zia ul Nabi PBUH" by Peer Karam Shah Sahab Al-Azhari 8. "The Reconstruction of Religious Thought in Islam" by Allama Muhammad Iqbal 9. "Islam Kya Hai" (اسلام کیا ہے) by Maulana Sadar ud din Islahi 10. "Islami Nazriya Hayat" by Prof. Khursheed Ahmad 11. "Principles of Islamic Jurisprudence" by Ahmad, H. (1993), IRI, IIUI 12. "Emergence of Islam" by Hameedullah, Muhammad. (1993). IRI, IIUI 13. "An Introduction to the Study of Islamic Law" by Hussan, H. (2007). Leaf publications 14. "Muslim Jurisprudence and the Quranic Law of Crimes" by Mir, W. (1982). Islamic Book Service 15. "Islamic Studies" by Prof. Mufti Munib-ur-Rehman, Karachi													
Grading Policy													
<table border="1"> <thead> <tr> <th>Assessment Instruments</th><th>Percentage</th></tr> </thead> <tbody> <tr> <td>Quizzes</td><td>15 %</td></tr> <tr> <td>Assignments</td><td>10 %</td></tr> <tr> <td>Presentation</td><td>10 %</td></tr> <tr> <td>Mid Term Exam</td><td>25 %</td></tr> <tr> <td>Final Exam</td><td>40 %</td></tr> </tbody> </table>		Assessment Instruments	Percentage	Quizzes	15 %	Assignments	10 %	Presentation	10 %	Mid Term Exam	25 %	Final Exam	40 %
Assessment Instruments	Percentage												
Quizzes	15 %												
Assignments	10 %												
Presentation	10 %												
Mid Term Exam	25 %												
Final Exam	40 %												
Week Wise Course Outline (Islamic Studies)													
Week	Contents												
1.	Introduction to Sources of Islam <ul style="list-style-type: none"> a. Introduction and basic Concepts of Al-Quran b. Introduction of Sunnah, Hadeeth, History, Kinds of Hadith 												
2.	<ul style="list-style-type: none"> a. Concept of Deen (تصویر دین) in the light of Quran and Sunnah b. Study of selected text on Aqaid, Ibadat, Muamlat, & Akhlaq from Holy Quran c. Quranic Language (QL) "Hua, Hia, Anta, Anti" هوا، هي، أنت، أنت 												

3.	a. Concept of Ibadat in Islam (اسلام کا تصور عبادت) b. Study of selected text from Holy Quran; Surat ul Baqra verse 177 c. Quranic Language (QL) "Anna, Nahnu" أنا، نحن
4.	Seerat . مکی دور) of Holy Prophet (S.A.W)-I a. Important Lessons Derived from the life of Holy Prophet in Makkah b. Basic Quranic Teachings of Adab-e-Nabi relate to Surat Al-Ahzab (Verse: 21, 56-57) Quranic Language (QL) "Hu, Haa, Hum" ه ، ها ، هم
5.	Seerat . مدنی دور) of Holy Prophet (S.A.W) -II a. Important Events with Lessons Derived from the life of Holy Prophet (S.A.W) in Madina b. Khutbah Hajja tul Wida (خطبہ حجتہ الوداع) Quranic Language (QL) "Hum, Haza, Zaalika, Ullaika" هم ، هذا ، ذلك، أولئك
6.	a. Basic concept of Halal and Haram (اسلام کا تصور حلال و حرام) b. Study of selected text of Al-Quran verses of Surat Al Araf verse 32. Quranic Language (QL) Past Tense "kattaba, Jalasa, Dakhalla, Kharaja, Nazara, Sam'i'a etc." فعل ماضی - کتب - جلس - دخل - خرچ - نظر
7.	Political System of Islam (اسلام کا سیاسی نظام) a. Basic Concepts of Islamic Political System b. Basic Institutions of Govt. in Islam c. Significant features of Riyasat e Madeena (ریاست مدینہ), Surat Al Hadid verse 25 Quranic Language (QL) Verbs with pronouns "Ta, Tii, Woo (For Plural)" الأفعال مع الضمائر- كتب- كتبوا
8.	Concept of Justice in Islam (اسلام کا نظام عدل) a. Basic Concepts of Islamic Law & Jurisprudence b. Sources of Islamic Law & Jurisprudence Quranic Language (QL) Verbs Muddareei "Yaktubu, Yajlissu, Yadkhullu, Yakhruju, Yanzuru, Yasmaau etc." فعل مضارع - يكتب - يجلس - يدخل - يخرج - ينظر - يسمع
9.	MID-TERM EXAMS
10.	Islamic Culture & Civilization (اسلامی تہذیب و ثقافت) a. Basic Concepts of Islamic Culture & Civilization b. Islamic Culture & Civilization and Contemporary Issues Quranic Verses Surat ul Aaraf 26, 27, & 28. Quranic Language (QL) Verbs Muddareei "Yaktubu, Taktuubu, Akubu, Naktabu" فعل مضارع - يكتب - تكتب - أكتب - نكتب
11.	Islam & Science (اسلام اور سائنس) a. Basic Concepts of Islam & Science

	b. Contributions of Muslims in the Development of Science Quranic Language (QL) Verbs Muddarei "ون" (For Plural) "Yaktubuna" فعل مضارع – يكتبون
12.	(اسلام کا معاشی نظام۔۱) a. Basic Concepts of Islamic Economic System b. Means of Distribution of wealth in Islamic Economics c. Islamic Concept of Riba Quranic Language (QL) Ism Faa'il "Katib, Qatil, Hakim etc." اسم فاعل – کاتب . قاتل – حاکم.....
13.	(اسلام کا معاشی نظام۔۲) a. Islamic Banking & Finance b. Islamic ways of Trade and Commerce Quranic Language (QL) Ism Maf'uul "Maktab, Maqtul, Mahkum etc." اسم مفہول – مکتوب - مقتول – محکوم
14.	(اسلام کا معاشرتی نظام۔۱) a. Basic Concepts of Social System of Islam b. Elements of Family دعاء صلاة – رب اجعلني مقيم الصلاة من ذريتي ربنا و تقبل دعاء ربنا اغفرلي ولوالدي وللمؤمنين يوم يقوم الحساب Quranic Language (QL) Fael Amr فعل أمر – اكتبْ – ادخلْ – اخرجْ
15.	(اسلام کا معاشرتی نظام۔۲) a. Ethical Values of Islam (اخلاقیات) b. Description with Verses of Surah Hujrat 6-9-10-11-12 c. Description in the light of Hadith Quranic Language (QL) Fael Nahi فعل نهی – لاتكتبْ – لاتخرجْ – لانتظر
16.	(اسلام اور غير مسلم معاشرے) a. In the light of Quran and Sunnah b. Surah Aal-e-Imran, verse 64 Quranic Language (QL) Revision With Dua
17.	REVISION
18.	FINAL EXAMS

2.6 Honours and Awards Committee

2.6.1 There shall be an Honours and Awards Committee which shall finalize nominations for Honours and Awards prior each Convocation. Composition of the Committee would be as under:

- | | | | |
|----|----------------------------|---|--|
| a. | Pro-Rector (Academics) | - | Chairman |
| b. | Registrar | - | Member |
| c. | Controller of Examinations | - | Member/ Secretary |
| d. | Director Academics | - | Member |
| e. | Director Health Sciences | - | Member (for Health Sciences Programs only) |
| f. | Director Quality Assurance | - | Member |
| g. | Concerned Director CU | - | Member |
| h. | Concerned Principal(s) | - | Member(s) |
| i. | Concerned HoDs | - | Co-Opted Members |

2.6.2 Working of the Committee would be based on following Terms of Reference:

- a. Director of respective CU shall forward the recommendations for related Honours/ Awards to the Secretary of the Committee (Controller of Examinations) at least 6 weeks prior the scheduled Convocation date, along with supporting documents. After scrutiny of the credentials of recommended candidates, the Secretary will coordinate with the Chairman to convene the Standing Committee meeting.
- b. The Committee shall review the eligibility of recommended candidates and shortlist provisional nominees for the Gold and Silver Medals, in light of prevailing BU Academic Rules, at least 4 weeks prior the Convocation.
- c. Lists of provisional nominees for Medals Awards shall be posted on Bahria University website and noticeboard of respective CU for any observation/ complaint within the stipulated timeframe.
- d. Any review of provisional nominees, based on the feedback/ recommendations of respective Director CU, is to be referred to the Standing Committee.
- e. After completion of the review process, recommended lists of Honours and Awards for related Convocation are to be submitted to the Rector for final approval.
- f. After approval of the Rector, the Secretary/ Controller of Examinations will promulgate the finalized lists of Honours and Awards to respective CUs for intimation of all concerned and preparation of Awards in scheduled Convocation.

AMENDMENT IN BU ACADEMIC RULES CHAPTER 9

Chapter 9 - HONOURS AND AWARDS

1. Preamble

Students achieving high academic standards will be awarded Academic Honours (Medals and Honour/ Merit/ Distinction Certificates) upon completion of their degree requirements at the Convocation Ceremony; processed through BU Honour and Awards Committee for approval of the Rector. In addition, Merit Scholarships, Financial Assistance Scholarships and a Mention in the Rector's Honours List are the Honours conferred during the course of studies. Cum Laude Honors will be recorded on the Transcript.

**BAHRIA UNIVERSITY ISLAMABAD
ISLAMABAD CAMPUS**
Master of Science in Computer Science*

**INTERIM TRANSCRIPT**

Student's Name : AASIA YASEEN
 Father's Name : GHULAM YASEEN
 Date Of Birth : 05 January 1995
 CNIC/ Passport No : 32102-7024549-4

Registration No : 62688
 Enrollment No : 01-243191-001
 Date of Admission : 04 February 2019
 Mode of Study : Regular
 Remarks : -

Deficient Courses **			
Course Code	Title	Cr Hrs	Passing Status
CSC 315	Theory of Automata	3	PASS
Spring Semester 2019			
Course Code	Title	Grade	Grade Point
CSC 521	Advanced Design and Analysis of Algorithm	B	3
ESC 701	Research Methodology	B+	3.33
		GPA :	3.17 CGPA :
		Overall Percentage :	70.7 CGPA :
		2.66	2.86

Course Code	Title	Grade	Grade Point	Cr. Hours	Product
CEN 720	Advanced Computer Architecture	C+	2.33	3	6.99
CSC 719	Machine Learning	C+	2.33	3	6.99
CSC 720	Advanced Operating Systems	B+	3.33	3	9.99

Interim Transcript
Program Incomplete

15 Credit hours Completed.

Program Status: Incomplete

* The Program consists of 33 credit hours, duration 2 years.

** Deficient Courses (passing criteria as per UG Rules).

Time bar effective from 4 February 2022.

Grade 'W' and 'I' Indicates status and not to be considered as grades

Deputy Director Examinations

Print Date : 21 July 2020

Note: Errors & omissions exempted

Shangrila Road, Naval Complex, Sector E-8 Islamabad, Pakistan Tel: +92-51-9260002-7 Ext 212, Fax: +92-51-9260885



Bahria University
Discovering Knowledge
BUHO

Registrar Notification No: 021/2020

See Distribution:

13 March 2020

ESTABLISHMENT OF BAHRIA BUSINESS SCHOOL (BBS) AND SCHOOL OF BAHRIA ENGINEERING AND APPLIED SCIENCES (BSEAS)

References:

- A. BU Statutes – 2016, Para 4.1.1, Figure 2 and Fig 7.
- B. BU Financial Rule 9.81- Schedule I.
- C. DHR Letter BUHR-10/2020/846 dated 3 March 2020.

1. With ever increasing number of students and Programs at BU, the present arrangement of CUs where director and principal duties are being performed by one person has become overburdening and hence less efficient. The BU Statutes vide Ref A do cater for this situation and provide for appointment of Principal(s) to evenly distribute the workload. The requirement, therefore, is to ease out the overburdened Directors of BUIC and BUKC and give due attention to academics by subject matter experts (SMEs).

2. Aforesaid in view, it has been decided by the competent authority to progressively shift to School System whereby, a group of constituent departments of a CU's Faculty will form a School. Each such school will function under the academic control of a dedicated Principal. This will be implemented in all CUs in phases. In Phase -I, following schools are established:

a. **Bahria School of Engineering and Applied Sciences (BSEAS) at BUIC.** All courses of Engg Disciplines and Applied Sciences i.e SE, EE, CE, CS and E&ES etc will be conducted at Bahria School of Engineering and Applied Sciences (BSEAS)– Islamabad Campus.

b. **Bahria Business School at Islamabad Campus.** All courses of Business Studies and Management Studies at BUIC will be conducted at Bahria Business School - Islamabad Campus.

c. **Bahria School of Engineering and Applied Sciences (BSEAS) at BUKC.** All courses of Engg Disciplines and Applied Sciences i.e SE, EE, CE, CS and E&ES etc will be conducted at Bahria School of Engineering and Applied Sciences (BSEAS) – Karachi Campus.

3. A school will be headed by a Principal for all its academic activities whereas, admin and logistic functions related to the school will continue to be looked after by, interalia, Director of Campus. The principal of School will be directly responsible to DG as shown in the organogram at Annex A. For Duties, responsibilities and Financial Powers, Principal is guided by BU Statutes – 2016 para 7.1 and BU Financial Rule 9.81 Schedule - I.

4. Directors of Islamabad and Karachi Campuses are to look after the academic affairs of the rest of the departments at BUIC/BUKC till such time they also revert to the School System or a dedicated Principal is appointed.

5. Principal of a school will normally be appointed for a period of two years.



Bahria University
Discovering Knowledge
BUHO

6. The Schools are to start functioning as per new organogram at Annex A from the date of appointment of Principal. In this regard Principal Bahria Business School at BUIC has been appointed vide Ref C.

Shafqat Azad

SHAFQAT AZAD SI(M), S.Bt
Commodore
Registrar

Annex:

A. Organogram

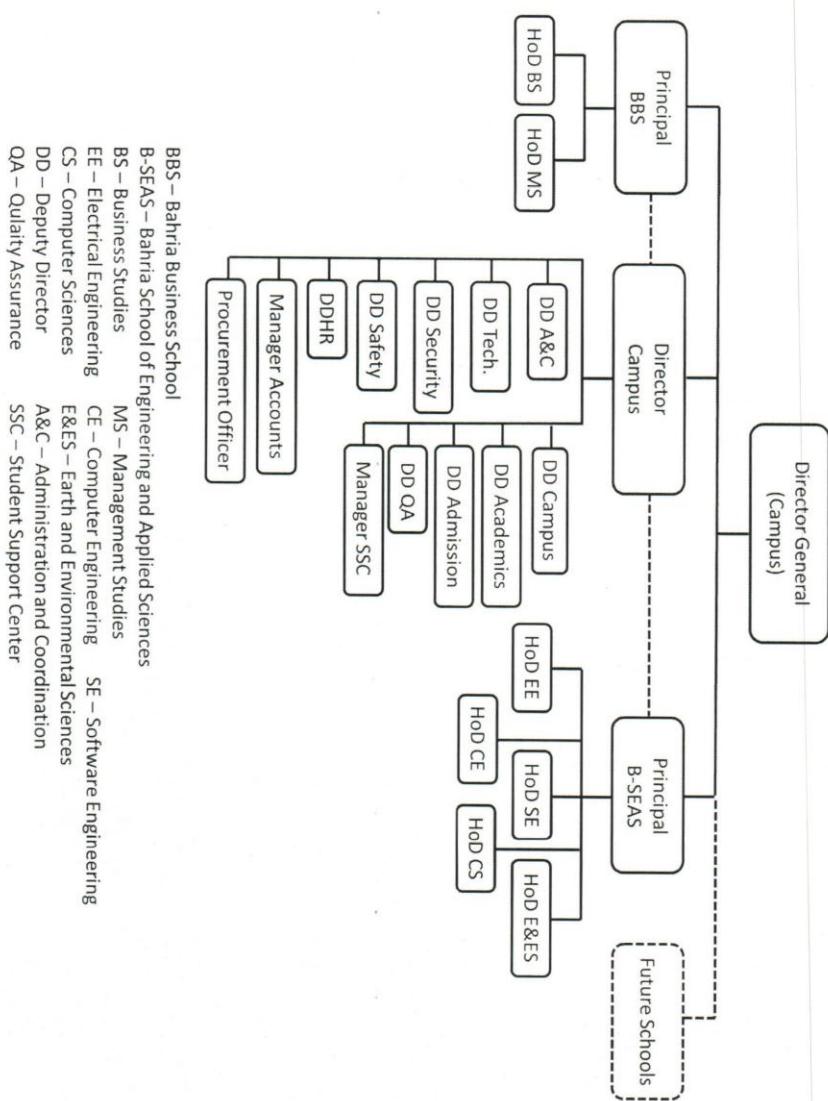
Distribution:

Internal:

Rector's Secretariat
All Pro-Rector's of BU
All Directors of BUHO
Dy Registrar (A & C)
Dy Registrar (Academics)
Dy Director (Admin) – BUHO
Dy Director (Coord)
Deputy Director (Regs)
Chief Librarian

External:

All DG's
All Dean's
All Directors of CUs
All Principals of CUs



Organogram for Concept of Schools at Bahria University



Registrar Notification No. 46/2020

See Distribution

11 June 2020

ESTABLISHMENT OF BAHRIA HUMANITIES & SOCIAL SCIENCES SCHOOL (BH3S) AT BUKC AND BUIC AND BAHRIA BUSINESS SCHOOL (BBS-KC) AT BUKC

References:

- A. BU Statutes-2016, Para 4.1.1, Figure 2 and Fig 7.
- B. BU Financial Rule 9.81-Schedule I.
- C. Registrar Notification No. 021/ 2020 dated 13 March 2020.

1. As per reference C, it was decided to progressively shift to school system and the three Schools (BSEAS and BBS at BUIC and BSEAS at BUKC) were established in Phase -1. Now in Phase-2, the Competent Authority has approved establishment of following Schools:

- a. **Bahria Humanities & Social Sciences School (BH3S) at BUIC and BUKC.** Following departments are to function under the BH3S:

- (1) Humanities & Social Sciences
- (2) Media
- (3) Law (only for BUIC for the time being)
- (4) Psychology (only for BUIC)
- (5) Islamic Studies
- (6) Any other department as and when established

- b. **Bahria Business School (BBS-KC) at BUKC.** All courses of Business Studies and Management Studies will be conducted at BBS (KC). Maritime Sciences Department for the time being is to be placed under BBS (KC) and later may form School of Maritime Sciences with sufficient intake/programmes.

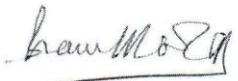
2. Department of Law at BUIC after accreditation visit of PBC is to be formed into a Bahria School of Law, for which case is to be processed by HOD Law Department.

3. Each School will be headed by a Principal for all academic activities whereas, admin and logistic functions related to the Schools will continue to be looked after by, interalia, Director of Campus. The Principal of School will be directly responsible to DG. For Duties, responsibilities and Financial Powers, Principal is guided by BU Statutes -2016 para 7.1 and BU Financial Rule 9.81 Schedule-I. The Organogram already issued vide reference C has been revised and attached at Annexes A&B.

- 4. The Principals will normally be appointed for a period of two years.
- 5. Dean MS is to prepare/put up roadmap for setting up of separate departments of Management Studies and Business Studies under BBS (KC) at BUKC by 15 June 2020.
- 6. DGs BUKC and BUIC are to give physical identity to the above mentioned Schools by relocating departments as appropriate and placing prominently the names of Schools and respective buildings within two weeks.

7. DIT is to update BU Website in coordination with all Principals of Schools established till to date. The contents related to BBS (KC) be updated after 10 July 2020 in consultation with team lead AACSB Program.

8. The Schools are to start functioning as per revised Organogram at Annex A from the date of appointment of Principal.


SHAPQAT AZAD SI(M), S.Bt
Commodore
Registrar

Annexes:

- A. Revised Organogram for Schools at BUIC
- B. Revised Organogram for Schools at BUKC

Distribution:

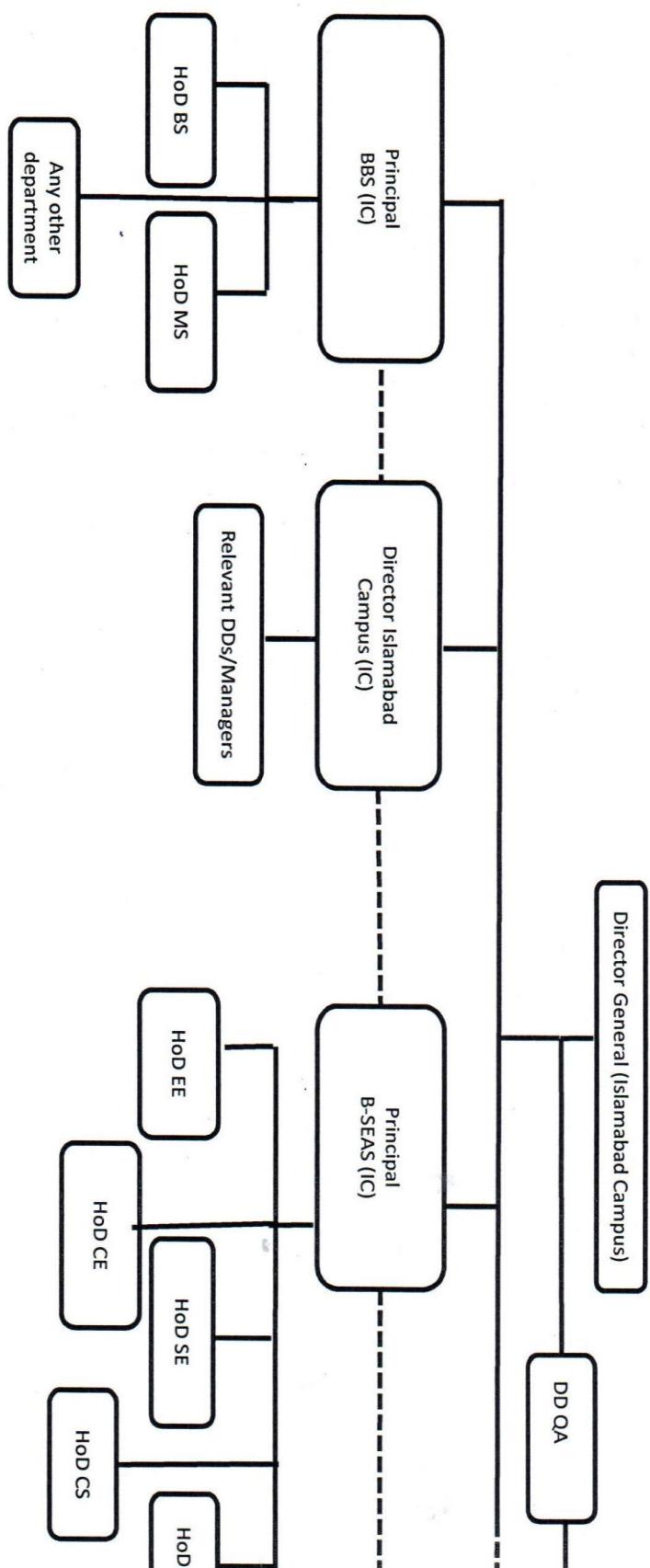
Internal

Rector's Secretariat
All Pro Rectors
All Deans
Controller of Examinations
Director (P&D)
Director BUEF
DMSTP
Director Admissions
PD BUM&DC (I)
Treasurer
Director Human Resource
Director Academic Affairs
Director Health Sciences
Director Quality Assurance
Director (ORIC)
Director (IT)
Director Student Affairs
Director (IO)
Director LDC
Director Marketing
Director Islamic Studies
Dy Director (Admin)- BUHO
Dy Director (Coord)
Deputy Director (Regs)
Chief Librarian

External

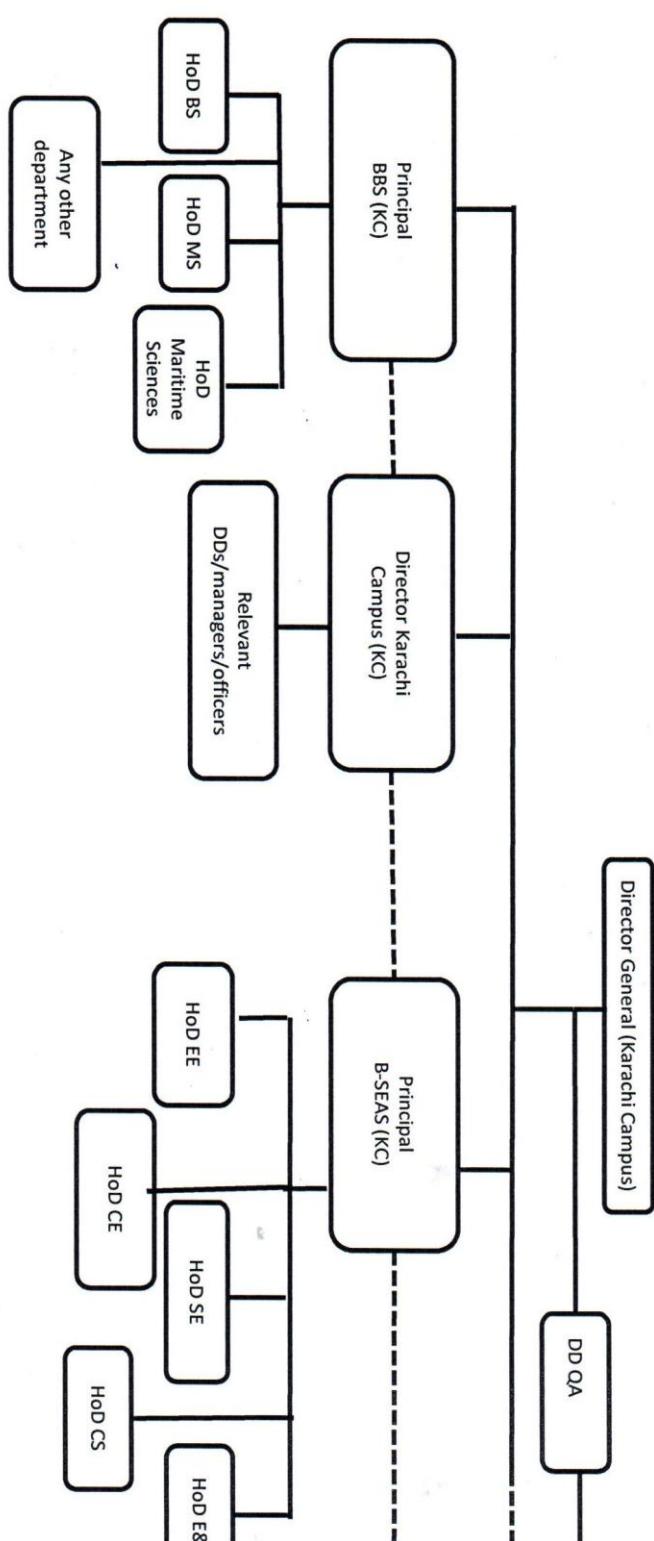
DG NIMA
DG BUM&DC, Karachi
DG BU Karachi Campus
Director BU Lahore Campus
Director NIMA, Karachi
Director NIMA, Islamabad
Director BU Islamabad Campus
Director BU Karachi Campus
Principal (Medical Section), Karachi
Principal (Dental Section), Karachi
Principal and Director IPP, Karachi
All Principals of Schools at BUIC, BUKC
Principal PNNC, Karachi
The Commanding Officer PNSL, Karachi

Revised Organogram - Schools at Bahria University Islamabad Campus



BBS – Bahria Business School
 B-SEAS – Bahria School of Engineering and Applied Sciences
 BHSS – Bahria Humanities & Social Sciences School
 BS – Business Studies
 EE – Electrical Engineering
 SE – Software Engineering
 CS – Computer Sciences
 DD – Deputy Director
 QA – Quality Assurance
 IC – Islamabad Campus

Revised Organogram - Schools at Bahria University Karachi Campus



BBS – Bahria Business School
 B-SEAS – Bahria School of Engineering and Applied Sciences
 BHSS- Bahria Humanities & Social Sciences School
 BS – Business Studies
 EE – Electrical Engineering
 SE – Software Engineering
 CS – Computer Sciences
 DD – Deputy Director
 QA – Quality Assurance
 KC – Karachi Campus

BBS – Bahria Business School
 B-SEAS – Bahria School of Engineering and Applied Sciences
 BHSS- Bahria Humanities & Social Sciences School
 BS – Business Studies
 MS – Management Studies
 CE – Computer Engineering
 E&ES – Earth and Environmental Sciences
 H&SS- Humanities & Social Sciences