

Minutes of
42nd Meeting of the Academic Council
held on 6 & 7 October 2022



Directorate of Academics
Bahria University Islamabad

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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	<p>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</p>
Decision on New Item	<p>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'</p>
Decision on Previous Item	<p>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'.</p>
Action	<p>Authority, Entity, Official, Person, Unit, Dept, Office, etc required to implement the decision</p>
Responsibility	<p>The supra single Authority, Entity, Official, Person, etc required to:</p> <ol style="list-style-type: none"> 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	<p>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.</p>
Deadlines	<p>Any time period deadlines shall count from the date of issue of the minutes. Time period in days shall imply working days.</p>

Acronyms and Abbreviations used in this Document

AACSB	Association to Advanced Collegiate School of Business
BBS	Bahria Business School
BH3S	Bahria Humanities and Social Sciences School
BSPP	Bahria School of Professional Psychology
BSEAS	Bahria School of Engineering and Applied Sciences
BUAR	Bahria University Academic Rules
BUCPT	Bahria University College of Physical Therapy
BUDC	Bahria University Dental College
BUHSC	Bahria University Health Sciences Campus
BUIC	Bahria University Islamabad Campus
BUKC	Bahria University Karachi Campus
BULC	Bahria University Lahore Campus
BULS	Bahria University Law School
BUMDC	Bahria University Medical & Dental College
BUMC	Bahria University Medical College
CH	Credit Hour(s)
CCH	Course Codes Handbook
CE	Computer Engineering
CS	Computer Sciences
CSE	Computer & Software Engineering
DA	Director Admissions
DAcad	Director Academics
DIPP	Director IPP
DLC	Director Lahore Campus
DM	Director Marketing
DS	Dental Section BUMDC
EDC	Estimated Date of Completion
EE	Electrical Engineering
EES	Earth & Environmental Sciences
EP	Examination 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
MS	Management Sciences
NCEAC	National Computing Education Accreditation Council
NBEAC	National Business Education Accreditation Council
PMC	Pakistan Medical Commission
PNC	Pakistan Nursing Council
PNNC	Pakistan Navy Nursing College
PFM	Permanent Faculty Member
PH	Public Health
SE	Software Engineering
SHB	Students Handbook
SCM	Supply Chain Management
UG	Undergraduate
URD	User Requirements Document
VFM	Visiting Faculty Member
wef	with effect from

Attendance**BUHO****Present**

1. Vice Admiral Kaleem Shaukat HI(M) (Retd)	Rector	in Chair
2. Rear Admiral Ather Saleem HI(M) (Retd)	Pro-Rector (RIC)	Member
3. Rear Admiral Zaka Ur Rehman HI(M) (Retd)	Pro-Rector (Academics)	Member
4. Cdre Shafqat Azad SI (M), S.Bt (Retd)	Registrar	Member
5. Dr Atif Raza Jafri	Dean ES/ Principal BSEAS-IC	Member
6. Dr Muhammad Naveed	Dean MS/ Principal BBS-IC	Member
7. Dr Adam Saud	Dean H&SS/ Principal BH3S-IC	Member
8. Cdre Asim Raza SI(M) (Retd)	Dir Academics	Member & Secy
9. Cdre Nasrullah SI(M) (Retd)	Controller of Exams	Member
10. Cdre M Masud Akram SI(M), S.Bt	Dir Admissions	Member
11. Brig Asif Ali Asif (Retd)	Dir Health Sciences	Member
12. Dr Asad Waqar	Dir PGP	Member
13. Mr Fazal Wahab	Dir DQA	Member
14. Dr Saleem Aslam	Dir ORIC	Member
15. Ms Waiza Rehman	Dir LDC	Member
16. Dr M. Awais Mehmood	Director IO	Member

In Attendance

17. Ms Sundal Mufti	Dir Student Affairs
18. Mr Rizwan Aamir	Dir IT
19. Capt Khalid Hameed PN (Retd)	Dy Registrar (Academics)
20. Cdr Zulfiqar Haider Malik PN (Retd)	Dy Registrar (Regulations)
21. Cdr Adnan Umer PN	Dy Director (Academics)

BUIC**Present**

22. Rear Admiral Naveed A. Rizvi HI(M) (Retd)	DG IC	Member
23. Dr Said Akber	HOD (EES) BSEAS-IC	Member
24. Dr Farrukh Shahzad	HOD (Media Studies) BH3S-IC	Member
25. Dr Rizwana Amin	HOD (PP) BH3S-IC	Member
26. Dr Syed Muhammad Shahid Tirmazi	HOD (IS) BH3S-IC	Member
27. Dr Muhammad Fayyaz	HOD Law	Member

In Attendance

28. Captain Sarfraz Khan PN (Retd)	Director Academics IC
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BUKC**Present**

29. Vice Adm K. G. Hussain HI(M) (Retd)	DG KC	Member
30. Cdre Muzammil Hussain SI(M), SE (Retd)	Director Admin	Member
31. Dr Mustaghis ur Rehman	Principal BBS-KC	Member
32. Dr Sohaib Ahmed	Principal BSEAS-KC	Member
33. Dr Oyoon A Razzaq	Principal BH3S-KC	Member
34. Dr Salma Hamza	HOD (E&ES) BSEAS-KC	Member
35. Dr Syed Safdar Ali	HOD (CS) BSEAS-KC	Member

36. Dr Liaqat Ali	HOD (MS) KC	Member
37. Dr Shoaib Mughal	HOD (CE) KC	Member
38. Dr Asif Inam	HOD (Maritime Sciences)	Member
39. Dr Talat Sharafat Rehmani	HOD (H&SS) BH3S-KC	Member
40. Dr Abdul Qadir	HOD (IS) BH3S-KC	Member
41. Dr Osama Rehman	HOD (SE) KC	Member
42. Dr Muhammad Ashfaq	HOD (Media Studies) BH3S-KC	Member
43. Dr Amir Feroz Shamsi	HOD (BBS) KC	Member

In Attendance

44. Capt Zaheer Ahmed PN (Retd)	Director Academics KC
45. Dr Mukhesh Kumar	Manager ORIC
46. Engr Erum Shafiq	Manager QA

BULC**Present**

47. Cdre Jawad Ahmed Qureshi SI(M)	Director LC	Member
48. Dr Adnan Hushmat	HOD (MS)	Member
49. Dr Khawaja Qasim Maqbool	HOD (CS & IT)	Member
50. Dr Urooj Sadiq	HOD (PP)	Member

In Attendance

51. Cdr Sajid Rahim (Retd)	Dy Director LC
52. Muhammad Umair Saeed	Manager QA

BUHSC**Present**

53. Vice Admiral Khalid Amin HI(M) (Retd)	DG	Member
54. Dr Ambreen Usmani	Dean HS/ Principal BUMC	Member
55. Dr Wahab Bukh Kadri	Principal BUDC	Member
56. Cdr Syeda Afshan	Principal PNNC	Member
57. Dr Nasim Karim	Principal BUHSC-PGI	Member
58. Dr Mahreen Lateef	Principal BUCAHS	Member
59. Dr Khalid Mustafar	Vice Principal BUMC	Member
60. Dr Kulsoom Fatima	Vice Principal BUDC	Member
61. Dr Khalid Aziz	Vice Principal BUCPT	Member
62. Prof Abida Razzaq	Vice Principal PNNC	Member
63. Dr Talea Hoor	Joint Director DME	Member
64. Dr Shakeel Ahmed	HOD (Paediatrics)	Member
65. Dr Naheed Sultan	HOD (Surgery)	Member
66. Prof Khalida Nasreen Abdullah T(M)	HOD (Obst and Gynae)	Member
67. Dr Nighat Rukhsana	HOD (Physiology)	Member
68. Dr Hasan Ali	HOD (Biochemistry)	Member
69. Dr M Sajid Abbas Jaffri	HOD (Medicine)	Member
70. Dr Syed Ahmed Omer	HOD (Dental)	Member
71. Dr Tabassum A Qadeer	HOD (Orthodontists)	Member
72. Dr Shama Asghar	HOD (Operative Dentistry)	Member
73. Dr Saman Hakeem	HOD (Prosthodontics)	Member
74. Dr Daud Mirza	HOD (Oral Pathology)	Member
75. Dr Beenish Fatima	HOD (Oral Biology)	Member

In Attendance

76. Dr Brig (Retd) Pervez Asghar	Professor of Medicine
77. Dr M. Najamuddin Shabbir	Professor of Surgery
78. Dr Summaya Shawana	Professor of Pathology
79. Dr Bibi Kulsoom	Professor of Biochemistry
80. Dr Shazia Shakoor	Professor of Physiology
81. Dr Iram Sadiqa	Professor of Physiology
82. Dr Shaikh Abdul Saeed	Professor of Physiology
83. Dr Quratulain Javiad	Associate Professor of Anatomy

Present

84. Dr Zainab Hussain Bhutto	Dean PP/ principal IPP	Member
85. Dr Kiran Bashir Ahmed	HOD (PP)	Member

IPP

PNSL

In Attendance

86. Muhammad Asmat Ullah	HOD BS(SCM)
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Preliminaries

Opening Remarks by the Chair

1. The Meeting was commenced with opening remarks by the Chairman Academic Council/ Rector BU. He welcomed all the participants and acknowledged that a lot had been achieved in various spheres since the last ACM, while the decisions taken were implemented in pursuance of intended objectives. He hoped that 2-days session of this ACM would be beneficial for effectively resolving the scheduled agenda items.

Confirmation of the Minutes of the 41st ACM held on 17-19 May 2022

2. The Secretary apprised the Council that draft minutes of the 41st ACM were communicated to all Members/ non-member participants on 17 May 2022. Comments thus received were incorporated accordingly, followed by processing on file for approval of the honorable Rector. Approved Minutes were disseminated to all concerned for implementation on 22 June 2022 through OAS.

3. Decision 4134 of 41st ACM pertained to launching of PhD Foundation Research Certification Course, for modalities of the proposal to be worked out further and processed through case file, while dropping the point. In compliance of the same, Course details and modalities were processed on file by Dean MS, for approval/ ratification by the Academic Council. The Secy recommended that, instead of pursuing the last ACM Decision 4134, Minutes of the last ACM may be amended by deleting the last sentence, "Point Dropped" from Decision 4134 in para 208. The proposal was approved by the Chair.

4. Accordingly, Minutes of 40th ACM were confirmed by the Council, with the amendment: deleting the last sentence, "Point Dropped" from Decision 4134 in para 208.

Review Items

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

Decision 41(3516)

5. BUKC is to review the study on *Revamping of Academic Programmes of E&ES* for conformance of the Decision of the last ACM, along with proper financial proposal for given recommendations. The report is to be processed on priority for early decision and subsequent ratification of approved recommendations in the next ACM. Progress is to be reported.

Progress

6. Study report on *Revamping of Academics Programs E&ES department at BUKC* has been forwarded to the committee for review and adding the cost analysis of suggested fee reduction. BUKC will update the progress during the ACM.

Discussion

7. Progress was presented by HOD E&ES, BSEAS-KC, covering the courses being offered and students' strengths in related programmes, as given at **Appendage 42(3516)**. Recommendations of the progress (setting up of communication labs; low intake in E&ES programmes for next 2 semesters; launching of short courses) were principally approved by the Chair. However, the Secy/ DAcad indicated that the progress did not cover the main aspect: *Revamping of Academic Programmes of E&ES*. DG BUKC explained that persistent low intake was being encountered in UG programmes for Geophysics and Geosciences, and proposed to freeze them till prospects of better

intake. After further discussion, the proposal was approved by the Chair, with instructions that related FMs may be reduced to the minimum required.

Decision

8. Following was approved by the Council:
- UG academic programmes ***BS in Geophysics*** and ***BS in Geosciences*** are to be frozen at BUKC and re-launched when better induction prospects are expected, with fresh approval from the Academic Council.
 - Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BSMAS-KC, DA	Dean ES
Statutory Documents Affected	Nil	

Item 3652: Approval of Case Writing Centers in Bahria Business School Islamabad and Karachi

Responsibility: Dean MS

Decision 41(3652)

9. Nomenclature and working mechanism of Case Writing Centers (CWC) at BUIC and BUKC are to be processed on file for approval, followed by ratification in next ACM. The proposal for Research and Business Solution Center (RBSC) is not approved. Progress is to be reported for CWC in the next ACM.

Progress

10. BUKC proposal has been forwarded to BUHO (Dean MS) through OAS case file. Dean MS will update the progress during the ACM.

Discussion

11. Dean MS explained that comprehensive proposal was being formulated on the recommendations of BUHO/ Acad Dte. The Chair directed to expedite the same, with full ownership by BBS-IC in capacity of the original sponsor. He further advised to process the case through case file on priority, preferably within next 15 days.

Decision

12. Nomenclature and working mechanism of CWC at BUIC and BUKC are to be processed on file, preferably within next 15 days (wef 6th October 2022), with full ownership of BBS-IC. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BBS-IC	Dean MS
Statutory Documents Affected	Nil	

Item 3910: Launch of New Programme *Bachelor of Science in Coastal & Marine Sciences* at the Department of Maritime Sciences, BUKC

Responsibility: Pro-Rector (RIC)

Decision 41(3910)

13. The following was approved by the Council:
- a. Bahria School of Maritime & Applied Sciences (BSMAS) is to be established within available BUKC premises w.e.f June 2022 with 2 x Departments: The Dept of Maritime Sciences and the Dept of Earth & Environmental Sciences.
 - b. Dept of Earth & Environmental Sciences under BSEAS-KC is to be shifted to the newly established BSMAS.
 - c. Organogram of BSMAS is to be processed for approval through the Registrar office, followed by ratification in the next ACM.
 - d. Committee Report for the *School of Maritime and Applied Sciences* is to be processed separately through the Acad Dte and the Registrar office, for approval and subsequent promulgation as guidelines for future adherence; while pursuing various phases of the new School as contained in the Report.
 - e. Launch proposal for *Bachelor of Science in Coastal & Marine Sciences* is to be reviewed for hybrid structure, change of title to the *Bachelor of Science in Marine & Coastal Engineering*, and inclusion of outline of proposed new courses; followed by processing of revised proposal through FBOS for approval on file and ratification in the next ACM.
 - f. Efforts are to be made to engage related public/ private sector departments (Fisheries, WWF, etc) for placement of the graduates of above stated programme, while pursuing fellowships from related bodies through MoU, etc.
 - g. Progress is to be reported.

Progress

14. Following progress has been received in this regard:
- a. Bahria School of Maritime and Applied Sciences (BSMAS) has been established at BUKC, along with approved organogram through Registrar Notification. Dr Asif Inam, Senior Associate Professor, has been appointed as the principal of the School on 19 August 2022.
 - b. As per instructions issued by BUHO, Department of Earth and Environmental Sciences at BUKC has been placed under BSMAS.
 - c. Pro-Rector (RIC) has submitted the Committee Report to the Rector for approval of roadmap of BSMAS along with organogram for future guidelines.
 - d. Proposal for the new programme *Bachelor of Science in Coastal & Marine Sciences* has been forwarded to Dean MS for consideration in the FBOS.
 - e. Draft copy of MoU between WWF Pakistan and BUKC has been submitted to BUHO for approval.

Discussion

15. Principal BSMAS presented the launch proposal for *Bachelor of Science in Coastal & Marine Sciences*, as given at **Appendage 42(3910)**. CE was asked to verify the course codes of new courses included in related Roadmap. Pro-Rector (Acad) suggested to include legal aspects in proposed Roadmap i.e *Law of the Sea*, to cover prevailing challenges in maritime legal domain. Principal BSMAS confirmed that the same was duly incorporated in proposed Roadmap. Pro-Rector (RIC) proposed to include indicated domains in MS Level, if not at UG level. DQA and Registrar proposed to approach related govt departments/ ministries for funding the proposed programme. The Secy proposed to approved the launch proposal for BS programme, while progress of engaging govt department may be monitored through BUKC Monthly Progress Reports. DG-KC indicated that low intake may be encountered after launching the proposed programme. The Chair agreed and noted

that BU will have to support this initiative to encourage higher education in maritime domain. DQA indicated that decision of last ACM included change of proposed programme title to *Engineering Marine* which was not complied. Dean ES explained procedural shortcomings/ non-PEC recognition for such degree programmes, which was concurred by the Chair. After further discussion, the Council approved launching the *Bachelor of Science in Coastal & Marine Sciences* programme with minimum intake and fee discount, with instructions for workshops/ seminars to attain success for new launch proposal.

Decision

16. The following was approved by the Council:
- Launch proposal for *Bachelor of Science in Coastal & Marine Sciences* at BSMAS-KC, as given at **Appendage 42(3910)**, from Spring 2023 semester.
 - Workshops/ seminars by Principal BSMAS-KC for successful launch of the new programme.
 - Progress to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BSMAS-KC, CE, DA	DG BUKC
Statutory Documents Affected	CCH, SHB	

Item 4001: Launch of New Program *Doctor of Philosophy in Computer Science* at BULC

Responsibility: Director BULC

Decision 41(4001)

17. Progress is to be reported.

Progress

18. HEC NOC was issued in August 2022, followed by the programme launched in Fall 2022 semester.

Discussion

19. Dir BULC apprised that a total of 6 x candidates applied for the programme, out of which 3 were shortlisted but dropped due to inadequate competence. After brief discussion, it was agreed that fresh admissions would be offered in the next semester.

Decision

20. Better admission response for *PhD in Computer Science* is to be pursued at BULC in Fall 2023 semester. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	Director BULC, DA, DPGP	Director BULC
Statutory Documents Affected	Nil	

Item 4016: Launch of New Program *Master of Science in Government and Public Policy* at BH3S-IC

Responsibility: Dean H&SS

Decision 41(4016)

21. Progress is to be reported.

Progress

22. HEC NOC was been issued in August 2022, while the degree programme will be launched in Spring 2023 semester.

Discussion

23. It was agreed that related curriculum will be revised in light of related discussion in the last BOG Meeting, and its outcome reported in the next ACM.

Decision

24. Curriculum of ***Master of Science in Government and Public Policy*** will be revised by concerned Dept in light of related discussion in the last BOG Meeting, and its outcome reported in the next ACM, along with the progress of programme launch in Spring 2023 semester.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BH3S-IC, CE, DA	Dean H&SS
Statutory Documents Affected	Nil	

Item 4017: Launch of New Program *Bachelor of Science in Mathematics* at BH3S-KC

Responsibility: Dean H&SS

Decision 41(4017)

25. Launch of *Bachelor of Science in Mathematics* at BH3S-KC from Fall 2022 semester is approved based on the revised financial details given at **Appendage 41(4017)**. Progress is to be reported.

Progress

26. Admission in the *Bachelor of Science in Mathematics* for Fall 2022 semester is in progress at BH3S-KC. Dept of H&SS has taken all necessary measures to conduct the said programme smoothly.

Discussion

27. Programme was not commenced due to low intake. A total of 30 x candidates were registered while only 6 x students deposited the fee. Concerned HOD proposed to reduce the fee structure, which was not approved the Chair. The school was asked to pursue better marketing for the admissions in next semester.

Decision

28. Principal BH3S-KC is to pursue better admission prospects in subject programme during the next semester. Progress is to be reported in next ACM.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BH3S-KC, DA, CE DM	Dean H&SS
Statutory Documents Affected	Nil	

Item 4027: Approval to Launch *Doctor of Philosophy (PhD)* Programme under the Faculty of Health Sciences at BUMDC

Responsibility: Dean HS

Decision 41(4027)

29. Launch of PhD programme under the Faculty of Health Sciences is approved for commencement from Spring 2023 semester, subject to NOC by the HEC. Progress is to be reported.

Progress

30. Documents submitted by DQA for NOC are under review at HEC, for issuance of NOC to launch the programme.

Discussion

31. The programme will be commenced from Fall 2023 semester, subject to NOC from HEC.

Decision

32. Progress of NOC from HEC followed by programme launch in Fall 2023 semester is to be reported in next ACM.

Action Required	Action by	Responsibility of
Implementation of the Decision	DQA, Principal BUMC	Dean HS
Statutory Documents Affected	Nil	

Item 4028: Formal Approval for Induction of Civilian Students in BS (Nursing) Program at PNNC
Responsibility: DG BUHSC

Decision 41(4028)

33. The following is to be complied:

- a. Male applicants are to be included in BSN programme from the next batch onward, in coordination with PNS SHIFA.
- b. Fee structure for female civilian students from remote areas is to be reviewed for compatibility with other nursing institutes.
- c. Provision of hostel facility to female civilian students is to be explored by BUHSC.
- d. Timeline for construction of PNNC is to be reviewed for early availability vis-à-vis increasing strength of students.
- e. Faculty members of PNNC are to be gradually increased to meet the minimum requirement promulgated by PNC.
- f. Progress is to be reported.

Progress

34. Following progress has been received in this regard:

- a. Proposed SOP for induction of Male nursing students has been forwarded by BUHSC to BUHO (DHS).
- b. Fee structure for Female candidates has been proposed as Rs 70,000 which may be revised annually.
- c. Hostel facility outside the Campus has been arranged for Female nursing students.
- d. Construction of PNNC will be processed in Phase-2; subject to availability of developmental budget.
- e. One candidate has been interviewed for the faculty post. Further Nursing FMs will be enhanced as per increase in students' number in the upcoming BSN admissions.

Discussion

35. DHS intimated that formal decision on induction of male students is awaited from NHQ. The Registrar indicated that DGMS office is not supporting the BU proposal. However, DNE reply is awaited, which is BU POC at NHQ. The Chair directed to pursue the same while fee structure for

PNNC has already been approved. However, if required to be revised, it may be processed again on case file. Moreover, BOG decision for construction of PNNC building may be executed accordingly.

Decision

36. DHS is to pursue the NHQ decision on induction of male students through DNE, while processing the proposed fee structure for non-uniformed students on case file (if required) and pursuing the BOG decision for construction of PNNC building. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DHS, Principal PNNC & Director P&D	Dean HS
Statutory Documents Affected	Nil	

Item 4109: Launch of New Programme *Bachelor of Science in Remote Sensing & GIS* at BSAES-KC

Responsibility: Dean ES

Decision 4109

37. The following is approved by the Academic Council:

- Launch of *Bachelor of Science in Remote Sensing & GIS* at BSAES-KC from Fall 2022 semester.
- Details of the programme as given at Appendage 4109, with minimum entry level to be at least 50% marks in HSSC/ equivalent and reduced Admission Fee of Rs 15,000.
- Approved programme to be launched at BSEAS-IC from Spring 2023 semester, with the launch proposal presented in the next ACM.
- Progress is to be reported.

Progress

38. Admissions in the programme *Bachelor of Remote Sensing & Geographical Information System* are in progress for Fall 2022 semester at BSEAS-KC, based on approved fee structure. The programme is also being launched at BSEAS-IC in Spring 2023 semester, as approved in the last ACM. HOD-E&ES BSEAS-IC will present the proposal for launch of the programme at BUIC.

Discussion

39. HOD E&ES BSEAS-IC presented the launch proposal for subject programme, as given at **Appendage 42(4109)**. He indicated that 1 x FM would be required to meet the faculty requirement, while all other support infrastructure was available. After brief discussion, the proposal was approved for launching at BSEAS-IC in Spring 2023 semester.

Decision

40. Launch proposal of *Bachelor of Remote Sensing & Geographical Information System* is approved for BSEAS-IC from Spring 2023 semester. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD-E&ES BSEAS-IC, DA, CE	Dean ES
Statutory Documents Affected	Nil	

Item 4119: Establishment of Bahria University Health Sciences Post-Graduate Institute

Responsibility: Dean HS

Decision 4119

41. The following is approved by the Academic Council:

- a. In-principal approval of the establishment of Bahria University Health Sciences Postgraduate Institute (BUHS-PGI) at BUHSC-K, with implementation timeline after the shifting of BUDC to its new premises.
- b. Details of the proposed Institute, including its organogram and supporting staff, are to be processed on separate case file for approval and subsequent ratification by the Academic Council.
- c. Progress is to be reported.

Progress

42. Following progress has been received in this regard:
 - a. Draft notification is in process of approval through OAS case file, with details including the organogram of BUHSC-PGI, Mission Statement, Objectives, Outcome, the infrastructure, faculty and support staff requirement, and phase-wise methodology after shifting of BUDC.
 - b. Decision for requirement of 6th floor of BUHSC building/ separate building is to be taken, depending upon the number of programmes and students in the PG Institute.

Discussion

43. Dean HS confirmed that Registrar Notification for establishment of BUHS-PGI had been promulgated, while Mission statement, Objectives, infrastructure etc of the Institute were being presented separately as new agenda item. After further discussion, it was agreed to drop the point as action complied.

Decision

44. Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean HS	Dean HS
Statutory Documents Affected	Nil	

Item 4121: Launch of New Programme *Bachelor of Science in Biotechnology* in BU College of Allied Health Sciences, BUHSC

Responsibility: Dean HS

Decision 4121

45. Launch of *BS in Biotechnology* at BUHSC-K from Spring 2023 semester is approved by the Council. Progress is to be reported.

Progress

46. Following progress has been received in this regard:
 - a. MCQs Bank for admission test paper has been updated, while courses have been assigned to subject teachers for making respective planners.
 - b. As approved in 6th DBOS-MLT, students of HSSC colleges will be invited for orientation in BUHSC for the offered programmes.
 - c. Admission campaign for Spring 2023 semester will be launched in October 2022.
 - d. Case file has been initiated for procurement of library books of Biotechnology.

Discussion

47. The progress of necessary preparations for the programme launch was considered satisfactory by the Council.

Decision

48. As the programme will be launched in Spring 2023 semester, its progress will be reviewed in the next ACM.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BCAHS	Dean HS
Statutory Documents Affected	Nil	

Item 4122: Adoption of Methodology for Improvement of Academically Weak Students

Responsibility: DAcad

Decision 4122

49. Methodology for improvement of academically weak students presented by Dean HS is approved for adoption in Annual HS programmes, i.e., MBBS and BDS. For all other/ semester-based programmes, standard methodology is to be adopted across all CUs/ faculties through the Deans Committee forum; taking lead from the tutorial-based approach. Progress is to be reported.

Progress

50. A study has been undertaken by the Acad Dte for standard methodology to improve the performance of academically weak students; comprising of improvements in related faculty development along with additional tutoring for students. The study is being circulated to all Deans for views/ comments followed by finalizing the proposal in the DCM scheduled in November 2022. The finalized proposal will then be processed on file for approval by the Chairman Academic Council/ Rector BU followed by ratification in next ACM.

Discussion

51. The Secy briefed the house that the study will be finalized in the DCM scheduled on 10 November 2022, followed by presentation in the next ACM.

Decision

52. Progress of the standardized methodology for semester based academically weak students is to be reported in next ACM.

Action Required	Action by	Responsibility of
Implementation of the Decision	DAcad	DAcad
Statutory Documents Affected	Nil	

Item 4130: Implementation of HEC Undergraduate Education Policy 2020

Responsibility: Director QA

Decision 4130

53. The Academic Council decided the following:

- a. Implementation of HEC UGE Policy 2020 is to be pended till the time queries raised to HEC by BU and VCs Committees are responded and deliberated by the Academic Council.

- b. HEC is to be intimated through DQA office of the BU constraints in adopting the following features of UGE Policy:
 - i. Centralized Admission System, due implications on low intake programmes.
 - ii. Entry test weightage for all admissions, due BU weightage already close to HEC.
 - iii. Option of Double Major and Minor at this stage, while it may be adopted gradually.
 - iv. Awarding Associate Degree after 2-years education, due need of more clarity.
 - v. Switching between General and Professional Degree programmes, due different educational background.
- c. All Deans are to deliberate the following aspects of the UGE Policy for adoption methodology, resources requirement and adoption timeframe for respective academic programmes:
 - i. Introduction of Practical Learning Lab (PLL).
 - ii. Mandatory 9-weeks Internship for all UG programmes.
 - iii. Establishment of Academic Advisement System at all CUs.
- d. Progress is to be reported.

Progress

54. HEC has been approached by DQA for clarification of queries raised during the ACM. Following feedback has been received to date:

It is for information of all that both policies (HEC UEG Policy and HEC PhD Policy) were circulated to all HEIs for feedback and now HEC is in process of compilation of these feedback. Same will be placed before next Commission for approval with minor changes in it. Hopefully it will be implemented from 2023.

55. All Deans were also approached by DQA to share the deliberations on HEC Policy as decided in the ACM. Feedback received from Dean ES is given at **Appendage 42(4130)**, for discussion during the ACM.

Discussion

56. Dean ES proposal was reviewed by the Council, while noting that HEC required PLL in alternate semesters due to inadequate resources for all students in each semester. Dean PP indicated that Dean ES proposal for PLL may not be applicable for other faculties. After further discussion, the Chair directed to pursue the HEC response on BU queries for further deliberation on subject Policy.

Decision

57. HEC response is to be pursued for BU queries on subject Policy. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DQA	DQA
Statutory Documents Affected	Nil	

Item 4134: Launching of PhD Foundation Research Certification Course

Responsibility: Dean MS

Decision 4134

58. Modalities of the proposal are to be worked out further and processed through case file.

Progress

59. Dean MS proposal was processed on OAS case file, reviewed in light of the recommendations by DQA and DPGP, and presented to the Rector in an exclusive meeting held at BUHO on 30 September 2022, as given at **Appendage 42(4134)**. After detailed discussion on all related aspects, the following was decided therein:

- a. Proposed certification course is formulated for improvement of Research Proposals submitted by the candidates for BU PhD programmes. However, the same can be attained through better interaction between the PhD candidate and Provisional Supervisor assigned by BU to the Admission Test qualified applicants, which presently lacks in substance.
- b. The quality of Research Proposals for admission in PHD programmes may be improved through formulation of timeline and milestones based formal instructions to the candidates, Potential Supervisors and concerned Dtes/ Depts.
- c. For better quality of research, admissions in BU PhD programmes may be offered annually; with adequate time before the final interview to enable the candidates to improve the quality of respective Research Proposals through guidance by the Provisional Supervisors.

Discussion

60. Dean MS proposal of formal certification course was considered as not required if the mechanism for preparation of PhD candidates for final selection was manifested/ practically improved as per written procedures, for better interaction between the candidates and potential Supervisors, leading to desired quality/ standard of Research Proposals. The Chair also shared inclination for adoption of annual admissions for PhD programmes, so as to attain better quality of scholars. In this regard, DA proposed a timeline based annual admissions programme. After further discussion, the Chair approved the proposal in-principle, while directing to process the detailed mechanism on case file.

Decision

61. Dean MS proposal for certification course is not approved, while annual admissions in PhD programmes is principally approved for adoption from Spring 2023 semester. Dir Admissions (DA) proposal for suitable mechanism to comply the same is to be processed on case file. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean MS, DA	Dean MS
Statutory Documents Affected	Nil	

Item 4135: Exemption of BS (Accounting & Finance) Courses to ACCA Students

Responsibility: Dean MS

Decision 4135

62. The proposal for exemption of BS (A&F) courses to ACCA students is to be processed on file and ratified in next ACM, if approved. Progress is to be reported.

Progress

63. HOD-MS and Prog Manager BS (A&F) of BBS-IC conducted a meeting with HEC and ACCA officials in August 2022 regarding provision of proposed exemption to ACCA students. It was learnt that currently there is no such policy/ rule exist to give exemptions to ACCA students at UG level. Therefore, withdrawal of the agenda item is requested by the sponsor.

Decision

64. Point Dropped, as proposed by the sponsor.

Action Required	Action by	Responsibility of
Implementation of the Decision	Dean MS	Dean MS
Statutory Documents Affected	Nil	

New Items**Item 4201: Approval of BS (Four-Year) Degree Program in Islamic Studies**

Sponsor: HOD Islamic Studies, BH3S-IC & KC

Referral Authority: FBOS-HSS

Summary of the Case

65. The Department of Islamic Studies was established in BH3S-IC and KC through the approval in 36th ACM. Since Fall 2021 semester, it has been successfully running the *MS in Islamic Studies* programme (Islam and Life) both at BH3S-IC and KC. Given the steady success and progress of the Department, FBOS-HSS has approved to expand its functioning through 4-years degree program *BS in Islamic Studies*.

Discussion

66. HOD IS, BH3S-IC presented the subject proposal, covering the POs, PLOs, etc. During detailed deliberations, the sponsor was asked to include the requirements for each major stream and the Final Transcript title (with Majors). Updated proposal as given at **Appendage 4201** was approved by the Council for launch w.e.f Spring 2023 semester.

Decision

67. Launch of *BS in Islamic Studies* at BH3S-IC and KC in Spring 2023 semester is approved, as given at **Appendage 4201**. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BH3S-IC, Principal BH3S-IC, DA	Dean H&SS
Statutory Documents Affected	CCH, SHB	

Item 4202: Change of Category of Course *Economics* from Core to Elective for *BS in Media Studies*

Sponsor: HOD Media Studies, BH3S-IC & KC

Referral Authority: FBOS-HSS

Summary of the Case

68. Roadmap for *BS in Media Studies* was approved in 31st ACM with course *Economics* offered as a Core course in 7th semester. However, a group of common courses is being taught in this programme. DBOS of Media Studies, BUIC and BUKC have suggested to change the category of course *Economic* (ECO 205) from Core to Elective in *BS in Media Studies* Roadmap. In replacement, the available courses from Elective courses shall be offered. FBOS-HSS has recommended the same for approval by the Academic Council.

Discussion

69. HOD Media Studies, BH3S-IC explained the requirement of proposed change of category; confirming that the no. of core courses required for subject programme are retained due already being more than minimum required. After brief discussion, the proposal was approved for adoption.

Decision

70. Change of category of course *Economics* from Core to Elective is approved for *BS in Media Studies* Roadmap; effective from Fall 2022 semester. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD Media Studies, BH3S-IC & KC	Dean H&SS
Statutory Documents Affected	SHB	

Item 4203: Addition of New Electives (in Majors) Course in *BS in Media Studies*

Sponsor: HOD Media Studies, BH3S-IC

Referral Authority: FBOS-HSS

Summary of the Case

71. Roadmap of *BS in Media Studies* was approved in 31st ACM and the 1st batch of this programme has graduated in Spring 2022. As per the market demand, DBOS of Media Studies has recommended to include the following new elective courses in this programme from Spring 2023, which has been recommended by FBOS-HSS for approval by the Academic Council:

Course Code	Course Title	Credit Hours
MED 325	Environmental Communication	3
MED 326	Media Psychology	3
MED 458	Strategic Communication	3
MTB 420	Social Media Analytics	3

Discussion

72. After brief discussion, the proposal was approved by the Council.

Decision

73. Inclusion of 4 x new Elective Courses in the Roadmap of *BS in Media Studies* is approved; effective from Spring 2023 semester. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD Media Studies, BH3S-IC	Dean H&SS
Statutory Documents Affected	CCH, SHB	

Item 4204: Addition of New Elective Course *Critical Thinking* in *BS in English* Roadmap

Sponsor: HOD SS, BH3S-IC

Referral Authority: FBOS-HSS

Summary of the Case

74. Critical thinking is a core academic skill that teaches undergraduate/ postgraduate students to question or reflect on their own knowledge and information presented to them. *Critical Thinking* courses promises to show its students how the disciplinary practices being introduced in that class use at least three of the following lenses: Reasoning; Representation; Cultural Judgment; Information Literacy; Metacognitive Reflection.

75. For *BS in English* students, teaching *Critical Thinking* (BES 103) as an elective course would help the students in analyzing and evaluating literary texts appropriate to their age and interests. This course is already offered in other departments and programmes as basic essential course, with

outline at **Appendage 4204**. FBOS-HSS has recommended inclusion of this course as Elective in the Roadmap of *BS in English*, for approval by the Academic Council.

Discussion

76. HOD SS, BH3S-IC explained the proposal to the Council. After brief discussion, the same was approved as proposed.

Decision

77. Addition of new Elective Course *Critical Thinking* in *BS in English* Roadmap was approved by the Council; effective from Spring 2023 semester. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD SS BH3S-IC	Dean H&SS
Statutory Documents Affected	CCH, SHB	

Item 4205: Change in Status of Thesis from Mandatory to Optional for BSS (*Anthropology*)

Sponsor: HOD SS, BH3S-IC

Referral Authority: FBOS-HSS

Summary of the Case

78. Anthropology holds distinction among all Social Sciences for unique research techniques. Keeping in view the practice in vogue, the Thesis for *BSS (Anthropology)* was declared mandatory, although a thesis at undergraduate level is generally an optional condition. Anthropological research is ideally based on primary data with participant observation technique, which is difficult for the students to carry out in the capital city (Islamabad) while having classes during the semester. Due to unavailability of research sites in the surroundings and compulsory requirement of the Thesis, students are resistant to enroll in specialization of Anthropology.

79. Keeping in view this hurdle, Thesis for undergraduate students of Anthropology may be made optional just like the students of International Relations and Development Studies streams of BSS. The proposal has been recommended by FBOS-HSS for approval by the Academic Council, with immediate implementation on all ongoing and upcoming semesters of BSS (*Anthropology*) stream.

Discussion

80. HOD SS, BH3S-IC explained the proposal to the Council. After brief discussion, the same was approved as proposed.

Decision

81. Change in status of Thesis from Mandatory to Optional for *BSS (Anthropology)* stream was approved by the Council, with immediate effect. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD SS, BH3S-IC	Dean H&SS
Statutory Documents Affected	SHB	

Item 4206: Allocation of Course Code to *Internship* in UG Programmes

Sponsor: HOD-SS BH3S-IC-KC

Referral Authority: FBOS-HSS

Summary of the Case

82. Launching of *BS in English* along with its Roadmap was approved in the 30th ACM held on 3 October 2017. Course Code for the *Internship* was missed in the roadmap at that time. As per BU Academic Rule 3.8, Internships will be non-credited but mandatory for degree completion.

Accordingly, all students of said program carry out the Internship with different well-reputed organizations. HOD-SS BH3S-KC suggested that course code be allotted to the Internship in *BS in English* programme, while FBOS-HSS has recommended that allocation of course code **SDW 496** to Internship for all undergraduate programmes of the Faculty of H&SS may be approved by the Academic Council.

Discussion

83. After brief discussion, the Chair proposed to delegate the power to amend/ finalize course codes to the CE, while approving the proposed allocation for subject case.

Decision

84. Allocation of course code *SDW 496* to *Internship* for all undergraduate programmes of the Faculty of H&SS is approved by the Council, while for future such cases the CE is delegated the powers to amend/ finalize the course codes. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	CE	Dean H&SS
Statutory Documents Affected	CCH, SHB	

Item 4207: New Course Outline for *Pakistan and Geo-political Studies*

Sponsor: HOD SS, BH3S-IC-KC

Referral Authority: FBOS-HSS

Summary of the Case

85. Course *Pakistan and Geo-political Studies* (HSS 403) is being offered in BBA programme, for which the faculty is hired from H&SS department. Upon scrutiny of different courses, it has been found that outline for this course and *Pakistan Studies* (PAK 102) are the same. Since title of this course is totally different from *Pakistan Studies*, a new course outline has been developed, which is comprehensive and reflects the true essence of contents falling under this title. FBOS-HSS has recommended the approval of proposed course outline by the Academic Council.

Discussion

86. New course outline was presented, as given at **Appendage 4207**. After discussing its contents, the same was approval by the Council.

Decision

87. New course outline for *Pakistan and Geo-political Studies* (HSS 403) was approved as presented, for adoption from Fall 2023 semester. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	HOD SS, BH3S-IC & KC	Dean H&SS
Statutory Documents Affected	Nil	

Item 4208: Combined TOS of MBBS 1st Year Curriculum

Sponsor: Principal BUMDC

Referral Authority: FBOS-HS

Summary of the Case

88. BUMDC has been advocating integrated teaching as a powerful method of teaching and learning; enabling the MBBS graduates for further studies both nationally and internationally. A necessary part of Integrated Learning is Integrated Assessment. Faculty of HS has developed the currently combined TOS to start this practice from the next 1st year MBBS.

Discussion

89. DME BUHSC presented the proposal for combined TOS of MBBS 1st year curriculum. Upon query, it was confirmed that FMDC, Abbottabad (affiliated with BU) is also willing to adopt the proposed TOS, while integrated teaching is already adopted. It was further confirmed that questions databank for the Final Exams would require a major review at the custodian premises (BUHO Exams Dte). The Chair advised Dean HS to provide the titles of Final Exams papers (current and integrated) to the Registrar, CE, DACad and DHS for more clarity.

Decision

90. Combined TOS of MBBS 1st year curriculum is approved for adoption from the 1st year MBBS batch of 2023 onwards, while all essential requirements of aligning the examinations aspects with new TOS of integrated assessment framework (including titles of Final Exams papers – current and integrated) are to be worked out by Dean HS in consultation with DHS and CE.

Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BUMDC, DHS, CE	Dean HS
Statutory Documents Affected	Nil	

Item 4209: Certificate in *Health Professions Education*

Sponsor: Dean HS

Referral Authority: FBOS-HS

Summary of the Case

91. Better curricular integration and assessment methods are required to impart quality education at all medical institutions. The need for well-trained, well-equipped and actively functioning faculty and researchers is the need of the day. Certificate course in *Health Professions Education* is one of the mandatory requirements of PMC for promotion in this category, and needs to be launched at BUHSC.

Discussion

92. Joint Director DME, BUHSC presented the proposal for *Certificate in Health Professions Education*, 3X FTF sessions covering 3 main themes related to medical education and the period covering the complete 6-months/ 24 weeks' duration. During subsequent discussion, it was directed by the Chair that all DME activities pertaining to external/ industrial linkages should be pursued through LDC, while Manager LDC in BUHSC organogram may be replaced with DME. After further discussion, the proposed course was approved by the Council with updated/ more comprehensive outline, as given at **Appendage 4209**, while the format of the certificate was advised to be processed through case file.

Decision

93. The following was approved by the Council:

- Launching of Certificate course in *Health Professions Education* at BUHSC is approved, as per updated outline at **Appendage 4209**.
- Format of the certificate is to be processed on case file.
- Manager LDC is to be replaced with DME in BUHSC organogram, while all DME activities pertaining to external/ industrial linkages are to be pursued at BUHO level through LDC.
- Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	DHS, Principal BUMC, LDC	Dean HS
Statutory Documents Affected	Nil	

Item 4210: Medical Ethics in Undergraduate Curriculum

Sponsor: Dean HS

Referral Authority: FBOS-HS

Summary of the Case

94. Medical Ethics is an integral part of medical education. PMC stipulates teaching of Bioethics to undergraduate medical students. Teaching of *Ethics* has been in progress at BUHSC since 2015. The objectives of *ethics* have been updated according to the objectives given by PMC in Section 4.12 of its Regulation, for teaching to the medical students.

Discussion

95. DME BUHSC presented revised Learning Objectives of course *Ethics*, as given at **Appendage 4210**. During subsequent discussion, DME explained that said course would not be mentioned in Final Transcript, as it is integrated module for each human organ. Further, PLOs presented by DME would be CLOs as subject proposal is of a course, not a programme. For MBBS, assessment of *ethics* will be an integral part of the main module being examined. After further discussion, the proposal was approved for adoption with amended TOS.

Decision

96. Revised CLOs of *Ethics* are approved for adoption, with amended TOS. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	DME BUHC, DIT	Dean HS
Statutory Documents Affected	BUHSC Website	

Item 4211: Mission Statement, Objectives and Goals of BUHSC-PGI

Sponsor: Dean HS

Referral Authority: FBOS-HS

Summary of the Case

97. Establishment of Bahria University Health Sciences Postgraduate Institute (BUHS-PGI) was principally approved in 41st ACM. Mission statement of the PGI and its Objectives & Goals have been processed on OAS case as given at **Appendage 4211**.

Discussion

98. Principal BUHS-PGI presented the Mission Statement, Objectives and Goals of BUHSC-PGI for approval by the Academic Council. After brief discussion, the same were approved as presented.

Decision

99. Mission Statement, Objectives and Goals of BUHSC-PGI are approved as presented. for approval by the Academic Council. Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BUHS-PGI, DIT	Dean HS
Statutory Documents Affected	BUHSC Website	

Item 4212: Change in TOS for BDS Curriculum

Sponsor: Principal BUDC

Referral Authority: FBOS-HS

Summary of the Case

100. Changes in TOS for BDS curriculum, based on weightage as suggested by respective HODs with consensus from FMDC, have been proposed in following subjects: Oral Biology; Community & Preventive Dentistry; General Medicine; Oral Medicine; Operative Dentistry; Orthodontics; Prosthodontics.

Discussion

101. Principal BUDC presented the proposed amendments in TOS for BDS curriculum, as given at **Appendage 4212**. He explained that TOS review is a regular activity every 4-5 years, with corresponding updating of related study guides. Further, few topics have been added as per the PMC requirement (previously not examined) which will be graded while keeping overall marks the same through re-adjustment of some other topics and the same paper setting. After further discussion, amended TOS was approved as presented.

Decision

102. Changes in TOS for BDS curriculum were approved as presented. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	Principal BUDC, CE	Dean HS
Statutory Documents Affected	Nil	

Item 4213: Ratification of the Organogram of BU Health Sciences Campus Islamabad

Sponsor: Director HS

Referral Authority: Case File

Summary of the Case

103. Bahria University is one of the leading Higher Educational Institution (HEIs) of Pakistan with campuses in major cities of the country. It has established a constituent Health Sciences Campus at Karachi for developing world class professional human resource in the field of Medical Sciences, Dentistry, Nursing, Paramedics, and Physical Therapy to meet the needs of healthcare sector. In pursuance of the same, Bahria University Health Sciences Campus is being established phase-wise at Naval Anchorage, Islamabad (NAI). Presently, the construction of Medical College is in progress, with scheduled completion by March 2023. Operationalization of the College is being worked out in parallel for PMC accreditation and subsequent admissions for 2023-24 academic session; subject to the timely completion of the building.

104. College Operationalization Committee (COC) in its first meeting on 1 July 2022, chaired by Rector BU, has finalised the organogram of Bahria University Health Sciences Campus, Islamabad (BUHSCI) to process the HR and other requirements for the operationalization of the Medical College. The organogram has been prepared on similar lines as that of BUHSC-Khi (attached as **Appendage 4213**) and submitted for approval by the Academic Council.

Discussion

105. Organogram of BUHSC-Ibd was presented by DHS and approved by the Chair as presented.

Decision

106. BUHSC-IBD organogram is approved for adoption, as given at **Appendage 4213**. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	Director HS, Registrar	Director HS
Statutory Documents Affected	BU Statutes	

Item 4214: SOP for Students' Exchange with Macquarie University, Australia

Sponsor: Director IO

Referral Authority: Case File

Summary of the Case

107. Macquarie University, a BU partner University in Australia, has confirmed its willingness to accept BU students on Study-abroad/ Exchange arrangement for a semester in Australia. According to this arrangement, BU can send its students to Macquarie University to study for one semester, during their Feb or Jul intake. Macquarie University will charge a discounted fee, applicable to partner Universities from BU students. The student will also have to bear their travel, living & miscellaneous expenses in Australia.

108. Keeping in view the practice followed by BU for exchange/ study abroad programme with other partner universities, an SOP has been prepared to define the students' selection and credit transfer mechanism, for approval by the Academic Council.

Discussion

109. DIO presented the SOP for students' exchange with Macquarie University, Australia, as given at **Appendage 4214**. He explained that Grades Mapping contained in it has been upgraded as per BU criterion. However, basic SOP of the exchange programme remains the same as already approved by the Academic Council for other foreign universities. While approving the SOP as presented, the Council decided that in future similar cases only the applicable Grades Mapping and any other changes from standard layout/ format should be presented for the Council approval.

Decision

110. The following was approved by the Council:

- SOP for students' exchange with Macquarie University, Australia as given at **Appendage 4214**.
- In future cases for students' exchange SOPs with foreign HEIs, only the applicable Grades Mapping and any other changes from standard layout/ format should be presented for Academic Council approval.
- Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DIO	DIO
Statutory Documents Affected	Nil	

Item 4215: SOP for Students' Exchange with University of Silesia in Katowice, Poland

Sponsor: Director IO

Referral Authority: Case File

Summary of the Case

111. In line with the Strategic Plan of Bahria University, a new agreement for exchange of students has been signed with University of Silesia (UoS) at Katowice, Poland. According to the Agreement, BU can send its students to UoS to study for a semester on exchange programme. No

tuition fee is to be paid by the student to UoS, and they will only have to bear their travel, living & miscellaneous expenses in Poland.

112. Keeping in view the practice followed by BU for exchange/ study abroad programme with other partner universities, an SOP has been prepared to define the students' selection and credit transfer mechanism, for approval by the Academic Council. DIO will present the same, for approval by the Academic Council.

Discussion

113. DIO presented the SOP for students' exchange with University of Silesia in Katowice, Poland as given at **Appendage 4215**. He indicated that the Grades Mapping in it has been amended as per the University criteria, while the basic SOP of the exchange program remains the same as already approved. The Council decided to approve the SOP on similar lines as adopted for Item 4214.

Decision

114. The following was approved by the Council:

- a. SOP for students' exchange with Silesia in Katowice, Poland as given at **Appendage 4215**.
- b. Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	DIO	DIO
Statutory Documents Affected	Nil	

Item 4216: Conduct of Examinations of a BU Student at CU other than Originally Registered

Sponsor: Controller of Examinations

Referral Authority: Case File

Summary of the Case

115. In absence of any policy to allow a BU student to appear for scheduled exams at a CU other than originally registered, a few such cases were approved on file under exceptional circumstances. In order to align the provision in BU Academic Rules in this regard, an amendment was processed through case file by the Exams Dte, which was approved by the Chairman Academic Council/ Rector CU for adoption as given at **Appendage 4216** subject to ratification by the Academic Council.

Discussion

116. CE presented the proposed amendment in BU Academic Rules for ratification by the Council, explaining its benefits to BU students. During detailed discussion, the Council noted that the proposed amendment would be applicable in exclusive cases only with very short time prior related exams, while its misuse by non-genuinely affected students would be hard to avoid. It was accordingly decided that proposed amendment may not be approved, while approval for such cases may be continued to be taken on grounds of exceptional circumstances.

Decision

117. Proposed amendment in BU Academic Rules is not approved. Status quo is to be maintained for related cases. All such cases are to be presented at ACM for ratification. Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	CE, DAcad	CE
Statutory Documents Affected	Nil	

Item 4217: Inclusion of Govt/ Industry Experts as Members of BU ACMs

Sponsor: Director Academics

Referral Authority: Case File

Summary of the Case

118. Compliance of BU Strategic Plan 2020-30 KPI 3.6.3 pertaining to the ***Inclusion of Govt/ Industry Experts as Members of BU ACM*** is being pursued through Deans' Committee. As explained by DSMP, the objective of such participation is to include members from external community in BU's statutory bodies to engage with industry for related input. However, it is not necessary that such members attend entire proceedings of the Meeting, and can be consulted for points of relevance including launch of new degree programmes, student grooming, etc. Accordingly, a suitable pool of such members can be formed for ACMs for consultation as per relevance/ requirement.

119. Based on the above stated, all Deans were asked during 9th DCM held on 13 June 2022 to nominate at least one suitable Govt/ industry expert to form a pool of experts for consultation on ACM matters as & when required. The nominations thus received from respective Deans and their Terms of Reference formulated by the Acad Dte need approval by the Academic Council in compliance of KPI 3.3.6.

Discussion

120. DAcad presented the nominees for govt/ industry experts for participation in ACMs, along with resume/ profile of each nominee and their Terms of Reference, as given at **Appendage 4217**. Dean ES indicated that such participation was being ensured through CACs (Curriculum Advisory Committees). The Chair noted that proposed participation could be availed as and when required for specific agenda items as co-opted members. DQA proposed that these experts could be involved at FBOS level as well, which was concurred by the Council.

Decision

121. The Council approved the nomination of govt/ industry experts along with their Terms of Reference as given at **Appendage 4217**, for participation in ACMs for specific agenda items as co-opted members. Point Dropped.

Action Required	Action by	Responsibility of
Implementation of the Decision	All Deans	Secy ACMs/ DAcad
Statutory Documents Affected	Nil	

Item 4218: Amendment in BU Academic Rules for Inter Campus Transfer of Engineering Students

Sponsor: Dean ES

Referral Authority: FBOS-ES

Summary of the Case

122. BU Academic Rule 2.3 allows inter-Campus transfer of BU students in the same programme with complete Transfer of Credit (ToC), without a loss of any credit earned. However, PEC has raised an objection on this practice as a deviation from PEC Regulations Article 3(d), which states that the transfer of credits shall not exceed 50% of programme total credits required even for the student seeking ToC within the same programme from one campus to other campus or from one institution/ college/ university to another institution/ college/ university.

123. In order to resolve the above stated PEC observation, Dean ES has proposed through a case file to insert a new clause in BU Acad Rule 2.3, stating that *For Engineering programmes, only 50% of the overall program credits are allowed to be transfer in case of inter-campus transfer within the*

same programme. The recommendation was evaluated by relevant Dtes and the following way forward proposed by DQA was approved by the Rector, for consideration by the Academic Council:

- a. Changes suggested by Dean ES should be deliberated in the Faculty Board of Studies of Engineering Sciences and recommend multiple solutions that meet PEC Regulations.
- b. Recommendations of FBOS should be presented in forthcoming Academic Council or should be approved by the honorable Rector and ratified in the Academic Council.
- c. If approved by the Academic Council, then should be ratified by the Executive Committee.

Discussion

124. Dean ES explained the procedure of changing CU of an Engineering student in PEC records, and its objection on BU practice. After detailed deliberations on the negative impact of stated PEC Regulation, whereby a BU student would have to repeat some courses in case of transfer from one BU Campus to another, the Chair advised to take up the matter officially with PEC on priority, while following the PEC Regulations till the suitable outcome is achieved. He further directed the Registrar, Dean ES, CE and DQA to jointly formulate a solution that meets PEC requirement as well as safeguards the interest of BU students.

Decision

125. The following was decided by the Council:

- a. Implications of PEC Regulation on BU students availing transfer from one BU Campus to another is to be officially taken up with PEC on priority.
- b. The PEC Regulation is to be followed through jointly formulated solution by the Registrar, Dean ES, CE and DQA that meets PEC requirement as well as safeguards the interest of BU students.
- c. Progress is to be reported.

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar, Dean ES, CE, DQA	Dean ES
Statutory Documents Affected	Nil	

Item 4219: Establishment of Bahria School of Professional Psychology at BUIC

Sponsor: Dean PP

Referral Authority: Case File

Summary of the Case

126. HOD PP-BUIC launched a proposal for establishment of Bahria School of Professional Psychology at BUIC. The proposal was processed on OAS case file and presented to the Rector at BUHO on 29 September 2022. After detailed discussion on related aspects, the proposal was principally approved for consideration by the Academic Council.

Discussion

127. HOD PP-BUIC presented the proposal along with organogram of BSPP and its Vision & Mission statements, as given at **Appendage 4219**, while explaining the rational for setting up the school with single Dept. DG BUIC further amplified that setting up the School of Professional Psychology was in conformance with school's system adopted in BU Campuses at Islamabad and Karachi. DQA supported the proposal, while the Chair acknowledged the BUIC capacity for expansion. After further discussion, the proposal was approved by the Council.

Decision

128. Establishment of Bahria School of Professional Psychology (BSPP) at BUIC is approved, along with the organogram and Mission statements as given at **Appendage 4219**. The Registrar is to notify the approval to all concerned, for subsequent compliance. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	Registrar, HOD PP BUIC	Dean PP
Statutory Documents Affected	BU Statutes	

Item 4220: Biannual Intake of *MS in Clinical Psychology* at BUIC

Sponsor: Dean PP

Referral Authority: Case File

Summary of the Case

129. *MS in Clinical Psychology* is being offered at BUIC by the Department of Professional Psychology since 2014. Being a flagship programme of the Dept, many students apply for it every year. Against the overwhelming response, the Department is offering this programme once a year (Fall semesters) with only 20 seats; because of the shortage of faculty. However, 3 PhD qualified FMs have joined the Dept in Spring 2022 semester, with overall 7 x PhD qualified and 8 x MS/ M.Phil qualified FMs. As such, the Dept is strengthened in terms of the FMs for the supervisory load of MS Theses. Therefore, Biannual intake for *MS in Clinical Psychology* programme is recommended to be adopted from Spring 2023 semester, with 20 seats in each admission cycle (Spring and Fall). The proposal entails **Nil** Establishment/ HR and Financial Effects.

Discussion

130. After brief discussion, the proposal was approved by the Council.

Decision

131. Biannual intake for *MS in Clinical Psychology* programme is approved for adoption at BUIC from Spring 2023 semester, with 20 seats in each admission cycle (Spring and Fall). **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	DA, HOD PP BUIC, DIT	Dean PP
Statutory Documents Affected	BU Website	

Item 4221: Approval of Course Codes for *MS in HRM & Organizational Psychology*

Sponsor: Dean MS

Referral Authority: Case File

Summary of the Case

132. Roadmap for *MS in HRM & Organizational Psychology* at BUKC was approved in 26th ACM held on 12-13 April 2016 without indication of course codes. FBOS-MS has now recommended amended Roadmap for ACM approval, with course codes verified by the Exams Dte, for approval by the ACM.

Discussion

133. The Chair indicated that the CE had already been empowered to finalize/ amend the course codes of ACM approved Roadmaps (vide Decision 4206 above). The proposal was, hence, approved by the Council.

Decision

134. Course Codes for *MS in HRM & Organizational Psychology* are approved as given at Appendage 4221. For similar future cases, the CE has been empowered vide Decision 4206 above to finalize/ amend the course codes of ACM approved Roadmaps. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	CE, All Deans	Dean MS
Statutory Documents Affected	Nil	

Item 4222: Amendments in BU Academic Rules 7.9.6 and 7.10.3

Sponsor: DAcad

Referral Authority: Case File

Summary of the Case

135. Amendments in BU Examinations Policy for the methodology to record the re-examinations of PNSL students in their Final Transcript have been approved in 41st ACM held on 7-9 May 2022. Corresponding amendments in BU Academic Rules are submitted for approval by the Academic Council, as given at **Appendage 4222**, followed by ratification by the Executive Committee.

Discussion

136. Proposed amendments were approved by the Council, as presented.

Decision

137. Amendments in BU Academic Rules 7.9.6 and 7.10.3 are approved as given at **Appendage 4222**, for ratification by the Executive Committee. **Point Dropped.**

Action Required	Action by	Responsibility of
Implementation of the Decision	DAcad, Registrar	DAcad
Statutory Documents Affected	BU Academic Rules	

Closing the Meeting

138. Secretary Academic Council presented the following timelines for follow-up actions and the next ACM, which was approved by the Chair for adoption by all concerned:

- | | |
|---|--------------------|
| a. 1 st Progress Report on Action Items of 42 nd ACM | 28 November 2022 |
| b. 2 nd Progress Report on Action Items of 42 nd ACM | 05 January 2023 |
| c. Agenda Items for 43 rd ACM (incl points from respective FBOS) | 05 January 2023 |
| d. Scheduled dates of 43 rd ACM | 08 & 09 March 2023 |

Closing Remarks by the Chair

139. The Chair concluded the Meeting by thanking the participants for their whole hearted participation during the 2-days of proceedings.

140. There being no other point, the Meeting was adjourned.

ASIM RAZA SI(M)
Commodore (Retd)
Director Academics
Secy Academic Council

Dated: 7 November 2022

Report
Revamping of Academic Programs at
E&ES- BUKC

Agenda 3516

Department of Earth & Environmental Sciences
Bahria University Karachi Campus

SUMMARY

1. With reference to decision 40 (3516) in 40th ACM a committee was formulated by the HoD E&ES vide HoD (E&ES) Letter No. E&ES/14/2021 on the 8th of November 2021 (Annexure-1), to study the academic programs at E&ES, BUKC. Dr Salma Hamza (President), Ms. Shaista Iftikhar, Mr. M. Jahangir Khan, Mr. M. Irfan, Ms. Sadia Hashmi and Mr. Ahsan Majeed Qureshi were nominated as the committee members. The committee was tasked to revamp the existing programs and propose new academic programs.
2. BS Geosciences (4 Years program) was approved in 35th ACM July 2020. The Geoscience program was designed to offer specialization in Geology, Geophysics and GIS. Till spring 2018, one under graduate program (BS Geophysics) and four post-graduate (MS Environmental Sciences, MS Geophysics, PhD Environmental Science & PhD Geophysics) were offered. After Fall 2018 Environmental Sciences Program is continuing at BS and MS levels. With all this infrastructure and grants, E&ES department is able to enroll 546 students in all its offered programs since 2008. In 2015 Digital Geophysical Data Lab (DGDL) was established which is equipped with state-of-the-art software and geophysical equipment. Pakistan Petroleum Limited sponsored hardware for the lab and licenses for latest industry level software were given by LMKR, dGB-Holland, RadExPro, CGG, Hampson-Russell, and others.

SUMMARY

3. The committee held meetings with senior industry persons and academicians for understanding the importance of Geoscience programs in the current job market.
4. The fee structure of other universities were also studied and found to be very low as compared with the BU fee structure for E&ES programs.
5. In the light of DBOS and meetings with industry experts, the committee proposed to retain BS Geosciences program with addition of specializations in RS & GIS for mineral/mining/groundwater exploration.
6. This high intake of students in Environmental and Geoscience Program of UoK and FUUAST is due to their low fee structure. Keeping this in view the fee structure should also be revised and at least 25-30% reduction is suggested.

FINDINGS:

1. BS Geosciences program was approved in 35th ACM and advertised for the first time for admission in Spring 2021 and Fall 2021, along with BS Environmental Sciences. However, it could not get started due to very low intake. BS Geosciences was not advertised for admission in Spring 2022.
2. Meetings were held with the senior energy personnel and discussed the importance of Geosciences programs and its job market in future. Followings are the views of senior energy personnel on the Geosciences program:

FINDINGS:

- a. Pakistan is an energy deficit country and rely heavily on fossil fuel to run business, transport and for domestic need. E&P (Exploration & Production) in Pakistan has ambitious target to fill the gap of energy demand to reduce foreign exchange. For this the demand of Geoscience graduate is still high for Pakistan (Director Exploration MPCL). Therefore, exploration activities will not subside in Pakistan.
- b. Recent business model of PPL and Federal government toward mineral sector is also an indication of new avenues for Geoscience students (senior exploration officials from PPL).
- c. BS Geosciences provide the seed field for GIS application in mineral, groundwater, oil and gas (Senior Geophysicist OGIL).
- d. OGDCL announce a graduate training internship program for Geoscience students and also hire geoscientists on permanent positions regularly (Senior Exploration Professional from OGDCL). Besides Oil & Gas exploration, OGDCL, PPL & GHPL, in collaboration with Canadian firms are opening new ventures in Coal mining sector & Reko Diq, Balochistan.

FINDINGS:

3. Due to the recession of oil and gas industry there is a shift towards new exploration opportunities in Groundwater and Mineral/Mining sector, particularly in Balochistan and Govt. of Pakistan. This will open new opportunities for students in the job market.
4. Four well equipped laboratories, Digital Geophysical Data Lab (DGD), GIS lab, Geochemical and Geological Labs exists in the department of E&ES. The labs, along with the faculty have the capabilities of providing training to industry/organizations' personnel like SGS and PPL, etc.
 - a- With the existing state of the art Digital Geophysical Data and GIS Labs, the department has a capability of participating in student competitions at both national and international levels.
 - b- Technical resources of Digital Geophysical Data Lab (DGD) & GIS Lab established by PPL, LMKR, dGB, which are providing platform for R&D / training / teaching in collaboration with industry (Sindh Energy, Urban Planning, PCSIR, etc).

FINDINGS:

5. In the light of DBOS and meetings with industry experts, the committee proposed to retain BS Geosciences program with addition of specializations in RS & GIS for mineral/mining/groundwater exploration.
6. The findings of low intake in BS Geosciences and BS Environmental Sciences Program are under:
 - a. It is observed that the programs related to Earth and Environmental Sciences offered by other universities in Karachi (e.g. Federal Urdu University of Arts, Science & Technology and University of Karachi) have very low Fee structure in comparison with Bahria University Karachi Campus.
 - b. Keeping in view the above mentioned, the fee structure should also be revised and at least 25-30% reduction is suggested

FINDINGS:

S.No.	University	Undergrad Program	Fee Structure (PKR)
1	University of Karachi	Geology	22,000
2		Environmental Studies	40,000
3	Federal Urdu University of Arts, Science and Technology	Geology	20,500
4		Environmental Sciences	23,000

Recommendations:

- The demand for Geosciences graduate is still high in Pakistan, as we are an energy deficit country and need to explore energy resources is not subsiding. The focus of E&P companies and government of Pakistan is now shifting toward mineral/mining/groundwater exploration. Considering the DBOS and meetings with industry experts, it proposed by the committee to retain BS Geosciences program with addition of specializations in RS & GIS for mineral/mining/groundwater exploration.
- Fee structure should also be revised and reduced at least 25-30%.

LAUNCH OF NEW PROGRAMME BACHELOR OF SCIENCE IN COASTAL & MARINE SCIENCES

A: ACADEMIC DETAILS	
1	Faculty/Department: DEPARTMENT OF MARITIME SCIENCES
2	Name or the program: BS Coastal & Marine Sciences (4 Years)
3	Mission or the Program: The department has planned to expand horizontally by launching programs in the discipline of Applied Marine and Coastal Sciences to develop required human resources for Pakistan Maritime Science and Technology Park (PMSTP) in the discipline of marine sciences. This human resource is likely to cater to the foreseeable challenges of climate change and coastal zone management. The proposed course is being taught all over the world but at present, the universities in the public or private sector in Pakistan are not offering this course.
4	Objectives of the Program: The BS (Coastal and Marine Sciences) would provide students with the knowledge and practical skills to plan and manage activities for conserving marine and coastal areas from anthropogenic and climate-induced effects. Fields of study will include Climate Change, Sea Level Rise, marine biology, Geographic Information Systems (GIS), geomorphology, and the physical environment of the coastal zone.
5	<p>Outcomes of the Programme: A graduate of the BS (Coastal and Marine Sciences) would be able</p> <ol style="list-style-type: none"> To apply principles and practices of coastal and marine sciences to the planning and sustainable management of coastal zones. He/She would be able to apply problem-solving and decision-making skills to develop innovative and sustainable solutions to the challenges being faced by Pakistan's coastal zones due to climate change. Would be qualified enough to locate, extract and interpret relevant evidence and scientific literature for decision making; critically assess the value of information and available data for the creation of a scientifically-based argument; Demonstrate written, oral, and interpersonal communication skills appropriate to the conduct of a science professional; argue the merits and limitations of current and developing technologies in marine and coastal research and management; use research and learning skills to maintain the currency of knowledge of the science related to the management of coastal and marine areas; evaluate and actively engage in their continued learning and development as environmental scientists; Recognize the national and global imperatives driving coastal changes to biological, chemical, and physical systems; integrate international case studies and experiences in the application of knowledge to coastal decision-making; incorporate indigenous and other community perspectives in the development of solutions to issues relating to the coastal zone, and demonstrate professional and ethical practice in keeping with community and industry standards, and relevant to marine science.
6	The rationale for the program: Pakistan has been grouped by the UNEP's Oceans and Coastal Areas Program Activity Centre among the countries which are most vulnerable to the effects of sea-level rise. The coastal areas are vulnerable for two reasons: rise in sea level and increased frequency and intensity of tropical cyclones. The threats associated with Climate change have already started exerting pressure not only on the coastal ecosystem but also causing a serious problem of coastal erosion and associated land loss. Most of the vital infrastructure along the Sindh and Makran coast would have to be protected and new structures would require non-conventional approaches. The proposed BS Coastal & Marine Science is going to cater to the requirement of trained and skilled manpower to undertake the challenging task of protecting the coastal infrastructure as well as habitants.

7	Brief Description of the Programme: The BS (Coastal and Marine Sciences) would provide students with the knowledge and practical skills to plan and manage activities for conserving marine and coastal areas from anthropogenic and climate-induced effects. Fields of study will include Climate Change, Sea Level Rise, marine biology, Geographic Information Systems (GIS), geomorphology, and the physical environment of the coastal zone. A graduate of the BS (Coastal and Marine Sciences) would be able to apply principles and practices of coastal and marine science to the planning and sustainable management of coastal zones by developing innovative and sustainable solutions to the challenges faced by Pakistan's coastal zones due to climate change.
8	Duration: 4 years
9	Venue(s): On-Site/Off-Site/Both On & Off-Site (Tick one; if Off-Site, give details): Department of Maritime Sciences, Bahria University Karachi Campus
10	Programme Scheduling Format; Morning/Evening/Weekend (tick one); Bi-Semester/Trimester/Semester+ Summer Session/Annual/Bi-Annual (tick one): Bi Semester er
11	Proposed Date of Commencement: Spring 2023
12	Mode of Study/Examination: As per BU Examination Rules
13	Additional Faculty Member(s) Required: (Indicate if there is a requirement for additional faculty members, full-time/visiting, along with qualifications): Two PFM with a minimum of 18 years of education will be required.
14	Additional Skilled-worker(s) Required: (Indicate if there is a requirement for additional Skilled Staff, full-time/part-time, along with their qualifications/skill sets.): One Lab/Field Technician
15	Additional Classroom(s) required: (The requirement is to include the number of classrooms and their capacities.) First Semester: 1 Additional one classroom with the start of every semester till the 8th semester.
16	Additional Requirement for Laboratories: (The requirement is to include the number of laboratories, their equipment, and their capacities). One general lab would be required in the second year and one lab would be shared with the Department of Earth & Environmental Sciences BUKC.
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/Repositories: Some books are already available in the library, NIO has offered access to its Research Library to the faculty of the Department of Maritime Sciences.
18	Minimum Entry Level: F. Sc/A Level With 2 CGPA or 50 % marks.
19	Admission Criteria: As per BU Rules
20	Additional/Different Examination Requirement: Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue). Nil
21	Number of Admissions Expected for First Intake: 20
22	Number of Admissions Planned/Expected for subsequent Intakes: 20
23	Referred by: DBOS
24	Complete Plan of Studies, inclusive of complete Roadmap: As below
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) (as below)
B. FINANCIAL DETAILS	
1	Source of Funding: BU: Fully/Partially: Fully
2	Degree Duration: <u>Annual or Semester System;</u> Annual Number of Years Semester Number of Semester: 8 Semester Total Number of Credit Hours: 135
3	The expected fee to be charged based on Cost & Benefits Analysis: (show working) Per annum fee: or Fee rate per credit hour: Rs. 4138

	Fee Rate / Credit Hour: Rs 3860 Tuition Fee/Semester/Student: Rs 3860 x 18 + 5000 = Rs 74,480																
4	Expected Number of students for 1st & 2nd Intakes: 20 & 20																
5	Expected Earning from first two Intakes (B5): (Show working): Tuition Fee/Semester/Student: Rs 74,480 Admission Fee and other Charges/Student (One Time): Rs. 21000+10000 = 31000 Earning from First Two Intakes: 2,109,600+1,489,600= 3,599,200																
6	Expected Earnings for the Next Five Years (B6): (show working) Rs. 101,816,400																
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): (Show working) 1 PFM x Rs 100,000/monthx12 months = 12,00,000.0																
8	Cost of Additional Laboratory Equipment/Tools (B8): (show working) : NIL One general lab facility shall be required. Alternatively, the lab of Earth & Environment Science would be used																
9	Cost of Additional Classrooms (B9): include furniture, technical aids, etc): NIL Existing classrooms facilities shall be used																
10	Cost of Additional Books, Subscription & Memberships to online Sites/Repositories (B10): (show details) <table border="1"><tr><td>Cost of one Book: 12000 Approximately on Average</td></tr><tr><td>Cost of 100 Books: 250, 000</td></tr></table>	Cost of one Book: 12000 Approximately on Average	Cost of 100 Books: 250, 000														
Cost of one Book: 12000 Approximately on Average																	
Cost of 100 Books: 250, 000																	
11	Off-Site rental Expenses and Cost of Other Fixtures (B11): (Show details) Nil																
12	Miscellaneous Expenses required for starting the Programme (B12) – <table border="1"><tr><td>-</td><td>Advertisement: 100,000</td></tr><tr><td>-</td><td>Printing & Stationery: 10,000</td></tr><tr><td>-</td><td>Admin Cost: 5000</td></tr><tr><td>-</td><td>Any other: 5000</td></tr><tr><td>-</td><td>Total: 1,20,000</td></tr></table>	-	Advertisement: 100,000	-	Printing & Stationery: 10,000	-	Admin Cost: 5000	-	Any other: 5000	-	Total: 1,20,000						
-	Advertisement: 100,000																
-	Printing & Stationery: 10,000																
-	Admin Cost: 5000																
-	Any other: 5000																
-	Total: 1,20,000																
13	Annual Recurring Expenditures in Subsequent Years (B13): <table border="1"><tr><td>-</td><td>Salaries (five years): - 12,000,00 per year</td></tr><tr><td>-</td><td>Rentals: - Nil</td></tr><tr><td>-</td><td>Subscriptions/Memberships: - Nil</td></tr><tr><td>-</td><td>Advertisements: 20,000 per year</td></tr><tr><td>-</td><td>Printing & Stationery: 20,000</td></tr><tr><td>-</td><td>Admin Cost: 50,000</td></tr><tr><td>-</td><td>Any other: 10,000</td></tr><tr><td>-</td><td>Total: 13,00,000</td></tr></table>	-	Salaries (five years): - 12,000,00 per year	-	Rentals: - Nil	-	Subscriptions/Memberships: - Nil	-	Advertisements: 20,000 per year	-	Printing & Stationery: 20,000	-	Admin Cost: 50,000	-	Any other: 10,000	-	Total: 13,00,000
-	Salaries (five years): - 12,000,00 per year																
-	Rentals: - Nil																
-	Subscriptions/Memberships: - Nil																
-	Advertisements: 20,000 per year																
-	Printing & Stationery: 20,000																
-	Admin Cost: 50,000																
-	Any other: 10,000																
-	Total: 13,00,000																
14	Total Cost of the Programme (B14): [Add B(7) to B(12) 12,00,000+1,20,000= Rs. 13,20,000																
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] Rs 13,20,000																
16	Net Earnings in First Year (B16: [Subtract B(15) from B(5)] For First Two Intake: 35,99,200-13,20,000= 22,79,200																

17	Projected Annual Gross Earning in Subsequent Years (B17): (show details & working; add 10% towards all expenses in subsequent years)			
	Year	Total Revenue (5 Years)	Total Expenses (5 Years) 10% increment/year	Net Earning
	Year1	5,708,800	370,000	5,338,800
	Year2	11,667,200	407,000	11,260,200
	Year3	17,394,000	447,700	16,946,300
	Year4	33,010,000	492,470	32,517,530
	Year5	34,036,400	541,717	33,494,683
		101,816,400	2,258,887	99,557,513
18	Projected Annual Net Earning in Subsequent Years: [Subtract B(13) from B(17) 98,257,513]			

Mapping of Roadmap in Specified Categories as per HEC UG Policy 2020

Program: BS (COASTAL AND MARINE SCIENCES)

Faculty: Management Sciences

a. General Education Requirement

Main Category	Sub-Category	Total Credit Hours	Course code	Course Title	Credit Hours	Remarks (Existing or new course, CHs added, etc.)
General Education Courses	Breadth courses (6) - Art & Humanities (2) - Natural Sciences (2) - Social Sciences (2)	18	ENG 132	Oral Communication	3	Existing
			MTM 533	Occupational Health and Safety, Risk and Disaster Management	3	Existing
			MOD 606	Ocean Dynamics	3	New
			CMS 604	Marine Geochemistry	3(2+1)	New
			HSS 202	Introduction to Sociology	3	Existing
			CMS 401	Socio-Ecological Fundamentals of Coastal Zones	3	New
	Civilizational courses Pakistan Studies (1) Islamic or Religious Studies (1)	6	Pak 101	Pakistan Studies	3	Existing
			ISI 101	Islamic Studies/Ethics	3	Existing

	Foundational Skills courses (5) - Expository Writing (3) - Quantitative Reasoning (2)	15	ENG 105	Functional English	3	Existing
			MRM 302	Research Project Writing Method	3	Existing
			CMS 701	Environmental Impact Assessment	3	New
			ITC 101	IT Skills	3	Existing
			BSS 307	Biostatistics	2+1	New

b. Disciplinary Requirement

Disciplinary Requirement Courses	Sub-Category	Course Code	Course Title	Credit Hours	Remarks (Existing or new course, CHs added, etc.)
Coastal and Marine Sciences	Discipline courses (Major)	CMS 301	Introduction to Marine Science	3	New
		MTM 120	Introduction to Meteorology & Oceanography	3	Existing
		CMS 303	Marine Biotechnology	3(2+1)	New
		CMS 304	Coastal Engineering	3	New
		CMS 302	Marine Resources	3	New
		MTM 222	Introduction to Coastal Zone Management	3	Existing
		MTM 224	Marine Pollution and Control	3	Existing
		CMS 402	Marine Microbiology	3(2+1)	New
		ENV 236	Introduction to Climate Change	3	Existing
		CMS 501	Oceanographic Instruments and Methods	3	New
		CMS 505	Marine Biodiversity	3(2+1)	New
		GEO 320	Marine Geology	3(2+1)	Existing
		CMS 602	Coastal ecosystem and Climate Change	3	New
		CMS 702	Marine Geophysics	3	New
		GEO 414	Physical Oceanography & Surveying	3	New
		MTM 401	Coastal Ecotourism Development and Management	3	Existing
		MTM 605	Sea Level Changes and Coastal Zones	3	Existing
	Distribution courses	CMS 201	Marine Ecology and Ecosystems	3(2+1)	New
		CHM 105	Chemistry	2+1	Existing
		MTM 402	Hydrographic Data & Services Management/Hydrography &	3	Existing

			Navigation		
			Elective I	3	
			Elective II	3	
			Elective III	3	
	Minor	ECO 101	Fundamental of Economics	3	Existing
		CMS 502	Marine Acoustics	3	New
		MAT 105	Mathematics	3	Existing
		GEO 105	Physical & General Geology	2+1	Existing
		MAT 205	Statistics	3	Existing Quantitative Reasoning
		GEO 437	GIS & Remote Sensing	3(2+1)	New
		PHY 101	Physics	3	Existing
	Lab/Fieldwork/ Thesis				
		SDW 499	Project/ Thesis	6	Existing

c. Practical Learning Requirements

Practical Learning Requirements	Category		Weeks/Hours	Course Code
	<i>Internship (9 weeks)</i>		<i>9/360</i>	<i>SDW 898</i>
	<i>Practical Learning Lab* (4 contact hrs per week)</i>			
		Entrepreneurship	Activities are planned to be undertaken as per the new HEC policy	
		Youth Club	Activities are planned to be undertaken regularly	
		Sports	Activities are planned to be undertaken regularly	

* weekly PLL activities are planned for all the semesters

Program Summary

Roadmap	Total Courses	Total CHs	Internship	PLL	Remarks
New Program	44	135	9 weeks	Activities are planned to be undertaken regularly	Internship time extended.

Semester-wise roadmap following HEC UG Policy 2020**Program: BS (COASTAL AND MARINE SCIENCES) Faculty: Bahria Business School****Semester 1:**

	Courses already offered by Maritime Sciences Department
	Courses offered by E&ES Department

Sr.#	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		ENG 105	Functional English	3	-	Expository Writing (1)	Existing
2		ITC 101	IT Skills	3		Quantitative Reasoning (1)	Existing
3		ECO 101	Fundamental of Economics	3		Minor (1)	Existing
4		CHM 105	Chemistry	2	1	Distribution (2)	Existing
5		PHY 101	Physics	3		Minor (7)	Existing
6		PAK 101	Pakistan Studies	3		Pakistan Studies (1)	Existing
Total Credit Hours				18			
Practical Learning Lab (4 contact hours per week)							

Semester 2:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		ISL 101	Islamic Studies/ Ethics	3	-	Islamiat (1)	Existing
2		MTM 533	Occupational Health and Safety, Risk and Disaster Management	3	-	Art & Humanities (2)	Existing
3		CMS 201	Marine Ecology and Ecosystems	2	1	Distribution (1)	New
4		HSS 202	Introduction to Sociology	3		Social Sciences (1)	Existing
5	ENG 105	ENG 132	Oral Communication	3		Art & Humanities (1)	Existing
6		MAT 105	Mathematics	3	-	Minor (3)	Existing
Total Credit Hours				18			
Practical Learning Lab (4 contact hours per week)							

Semester 3:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		CMS 301	Introduction to Marine Science	3	-	Major (1)	New
2		MTM 120	Introduction to Meteorology & Oceanography	3		Major (2)	Existing
3		CMS 304	Coastal Engineering	3		Major (4)	New
4	CMS 301	CMS 302	Marine Resources	3		Major (5)	New
5		CMS303	Marine Biotechnology	2	1	Major (3)	New
6		MAT205	Statistics	3		Minor (5)	Existing
Total Credit Hours				18			
Practical Learning Lab (4 contact hours per week)							

Semester 4:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1	CMS 304	MTM 222	Introduction to Coastal Zone Management	3	-	Major (6)	Existing
2		MTM 224	Marine Pollution and Control	3	-	Major (7)	Existing
3		GEO105	Physical & General Geology	2	1	Minor (4)	Existing
4		CMS401	Socio-Ecological Fundamentals of Coastal Zones	3	-	Social Sciences (2)	New
5		CMS 507	Coastal Processes	3	-	Major	New
6		ENV 236	Introduction to Climate Change	3		Major (9)	Existing
Total Credit Hours				18			
Practical Learning Lab (4 contact hours per week)							

Semester 5:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours	Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
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							<i>added, etc.)</i>
				Theory	Lab		
1		GEO 437	GIS & Remote Sensing	2	1	Minor (6)	Existing
2		CMS 501	Oceanographic Instruments and Methods	3		Major (10)	New
3		CMS 505	Marine Biodiversity	3		Major (11)	New
4		CMS 502	Marine Acoustics	3		Minor (2)	New
5	MAT 205	BSS 307	Biostatistics	3		Quantitative Reasoning (2)	New
6	GEO 105	GEO 320	Marine Geology	3		Major (12)	Existing
	Total			18			
	Practical Learning Lab (4 contact hours per week)						

Semester 6:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1	ENV 236	CMS 602	Coastal ecosystem and Climate Change	3		Major (13)	New
2		MTM 402	Hydrographic Data & Services Management/Hydrography & Navigation	3	-	Distribution (3)	Existing
3		GEO 414	Physical Oceanography & Surveying	3	-	Major (14)	New
4	MTM 120	MOD 606	Ocean Dynamics	3		Natural Sciences (1)	New
5	CHM 105	CMS 604	Marine Geochemistry	2	1	Natural Sciences (2)	New
6		MRM 302	Research Project Writing Method	3	-	Expository Writing (2)	Existing
Total				18			
		Practical Learning Lab (4 contact hours per week)					

Semester 7:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		CMS 701	Environmental Impact Assessment	3	-	Expository Writing (3)	New
2		CMS 702	Marine Geophysics	3		Major (15)	New
3		MTM 401	Coastal Ecotourism Development and Management	3	-	Major (16)	Existing
4		-	ELECTIVE I	3		Distribution (4)	-

5		-	ELECTIVE II	3		Distribution (5)	-
Total				15			
			Practical Learning Lab (4 contact hours per week)				

Semester 8:

Sr. #	Pre-Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		-	ELECTIVE III	3		Distribution (6)	-
2		MTM 605	Sea Level Changes and Coastal Zones	3	-	Major (17)	Existing
3	MRM 302	SDW 499	Project/ Thesis	6		Major (18)	Existing
Total				12			
		Practical Learning Lab (4 contact hours per week)					

Program Summary:

Total Courses	Total Credit Hours
44	135

ELECTIVES

Sr. #	Pre- Req	Course Code	Course Title	Credit Hours		Category as per HEC Policy	Remarks (Existing or new course, CHs added, etc.)
				Theory	Lab		
1		MTM 603	Natural Hazards and Management	3	-	Major	Existing
2		MTM 604	Coastal and Marine Sedimentology	3	-	Major	Existing
3		CMS 608	Coastal Resilience and Disaster Risk Reduction	3	-	Major	New
4		MTM 322	Fisheries Resources & Management	3		Major	E
5		MTM 607	Coastal Land Reclamation	3	-	Major	Existing
6		MTM 608	Mangrove Coastal Forest Management	3	-	Major	Existing
7		CMS 613	Marine Protected Areas Management	3	-	Major	New
8		MTM 610	Ocean Waves, Tides, and Currents	3	-	Major	Existing
9		CMS 402	Marine Microbiology	2	1	Major (8)	New
10		CMS 508	Satellite Oceanography	3		Major	New

COURSE OUTLINES

Bachelor of Science in Coastal & Marine Sciences

FUNCTIONAL ENGLISH (ENG 105)

Course Description

The purpose of this course is to develop the English-language proficiency of students and to help them become confident in reading, writing, speaking, and listening to the English language. Instead of teaching grammar in isolation and only at the sentence level, this course is based on developing the language abilities of students through an integrated approach that provides opportunities to develop their listening, speaking, reading, and writing skills.

Course Content

Grammar
Construction of Sentence
Reading skills
Writing skills
Reading Material

Banks, D. (2019). A systemic functional grammar of English: a simple introduction. Routledge.
T. K. Carver and S. Fortinos-Riggs, Conversation Book II – English in Everyday Life (New York: Pearson Education Limited, 2006).
J. Eastwood, Oxford Practice Grammar (Karachi: Oxford University Press, 2005).
J. Swan, Practical English Usage, 3rd ed. (New York: Oxford University Press, 2005).

CHEMISTRY (CHM 105)

Course Description

The main objective of this course is to provide basic knowledge and understanding of chemistry and the principles of chemical reactions. The course not only provides excellent practice in basic chemistry but also allows the rigorous development of experimental schemes and analysis methods, relying on physical chemistry and analytical reasoning.

Course Content:

Chemical Bonding, Periodic tables. Ionic, covalent, coordinate covalent bond. Radioactivity and its environmental hazards. General chemistry of functional groups of organic compounds (alcohols, carbonyls, esters, carboxylic acids, amines). Aromatic compounds, ions, radicals. Photochemical reactions. Chemistry solution. Surface chemistry. Colloids chemistry. Thermodynamics and chemical kinetics.

Lab. Work:

Preparation of molar, molal, and normal solutions/buffers. Osmosis and Dialysis. Paper Chromatography (one and two-dimensional), thin layer chromatography, Column chromatography. Measurement of pH, EC, and TDS. Use of titrimetric and gravimetric analysis. Use of spectrophotometric techniques.

Reading Material

Smith, M. B. (2020). March's advanced organic chemistry: reactions, mechanisms, and structure. John Wiley & Sons.

Andrews, J.E., Brimblecombe, P., Jickells, T.D., Liss, P.S. and Reid, B.J., 2004. *An Introduction to Environmental Chemistry*. 2nd Edition. Blackwell Science, UK.

Freeman, W.H., 2003. Qualitative Chemical Analysis, Harris, D.C., 6th Edition. and Company, USA.

Girard, J.E., 2005. Principles of Environmental Chemistry, 1st Ed. Jones and Barlett, USA.

Hill, M. K., 2004. Understanding Environmental Pollution, 2nd Edition. Cambridge University Press, UK.

Skoog, D.A., West, D.M. and Holler, F.J., 2004. *Fundamentals of Analytical Chemistry*. 8th Edition. Thomson and Brooks, Canada.

MATHEMATICS (MAT 105)

Course Description

It will cover 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 Combination; Mathematical Induction and Binomial Theorem; Basics of Vector Analysis; Basic Coordinate Geometry; Limits and Continuity of Functions; Differentiation and Integration of Functions.

Course Content

Natural numbers, complex numbers, p-adics
Real division Algebras
Infinitesimals, games, and Sets

Reading Material

Russell, B. (2020). The principles of mathematics. Routledge.

Hermes, Hiebruch, Koecher, Mainzer, Neukirc, Prestell & Remmert, Numbers, English Ed, Springer-Verlag New York, 1991.

Fulton/Harns, Representation Theory: A First Course, 1st Ed, Springer-Verlag New York, 2004.

Remmert, Theory of Complex Functions, 2nd Ed, Springer-Verlag New York, 1990.

ISLAMIC STUDIES/ETHICS (ISI 101)

Course Description

Islamic ethics is the study of the methods practised by Muslims to discover the best way they should engage with other individuals and the rest of the world. Islamic reasoning is a holistic approach to behaviour, reuniting the principles and tools of Islamic laws with the exemplary conduct of the prophet Muhammad (S.A.W.), in a manner that is appropriate to an actual ethical case. The students will examine principled reasoning in classical Islamic jurisprudence, the theological status of reason in Islam, the principles and priorities of traditional ethical reasoning, the arguments for a goal-oriented approach to ethics, the contemporary emphasis on the context of the ethicist, and the construction of religious authority, and the importance of individual moral formation. This course will enhance the skill of the students in understanding issues related to faith and religious life.

Course Content

Introduction to Quranic Studies, Study of Selected Text of Holy Quran, Seerat of Holy Prophet (S.A.W), Introduction To Sunnah, Introduction To Islamic Law & Jurisprudence, Islamic Culture & Civilization, Islam & Science, Islamic Economic System, Political System of Islam, Islamic History, Social System of Islam.

Reading Material

Hameedullah Muhammad, "Emergence of Islam", IRI, Islamabad

Hameedullah Muhammad, "Muslim Conduct of State"

Hameedullah Muhammad, 'Introduction to Islam

Mulana Muhammad YousafIslahi," Hussain Hamid Hassan, "An Introduction to the Study of Islamic Law" leaf Publication Islamabad, Pakistan.

Ahmad Hasan, "Principles of Islamic Jurisprudence" Islamic Research Institute, International Islamic University, Islamabad (1993)

Mir Waliullah, "Muslim Jurisprudence and the Quranic Law of Crimes" Islamic Book Service (1982)

H.S. Bhatia, "Studies in Islamic Law, Religion and Society" Deep & Deep Publications New Delhi (1989)

Dr Muhammad Zia-ul-Haq, "Introduction to Al-Sharia Al Islamia" Allama Iqbal Open University, Islamabad (2001)

PHYSICS (PHY 101)

Course Description

This course is designed to enable students to acquire a basic understanding of the physical world, its origin, and its structure to help the potential application of unexplored and unidentified organisms in the industry.

Course Content

Newton's gravitation law; Kepler laws; Electro statistics; Magnetism; Amperes1aw; 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.

Lab. Work:

Specific experiments.

Reading Material

Mansfield, M. M., & O'sullivan, C. (2020). Understanding physics. John Wiley & Sons.

Boas, M.L., Mathematical Methods in Physical Sciences. John Willey& Sons.

Subrahmanyam N. and BrijLal, Waves and Oscillations. Vikas Publishing House Pvt. Ltd., NewDelhi.

Tewari, K.K., Electricity and Magnetism, S. Chand & Co., Ltd.

STATISTICS (MAT 205)**Course Description**

The course is designed to provide students of business and economics with the basic concepts of data analysis and statistical computing. Topics covered include basic descriptive measures, measures of association, probability theory, confidence intervals, hypothesis testing, sampling distributions, normal theory estimation, regression and correlation, and exploratory data analysis. This course provides students with pragmatic tools for assessing statistical claims and conducting their statistical analyses.

Course Content

Histograms, The average, The standard deviation, The normal curve, and Correlation. Statistical reasoning, The theory of probability. Chance Models, Expected value, Standard error, Probability histograms, Convergence to the normal curve. Statistical inference, Estimation, Measurement Error, and Tests of statistical significance.

Reading Material

Frost, J. (2020). Introduction to Statistics: An Intuitive Guide for Analyzing Data and Freedman, David, Robert Pisani, & Roger Pervis (2007). Statistics. New York: W. W. Norton. James, Gareth, Daniela Witten, Trevor Hastie, & Robert Tibshirani (2013). An Introduction to Statistical Learning: With Applications in R. New York: Springer. •Kabacoff, Robert (2015). R In Action: Data Analysis and Graphics with R. Shelter Island, NY: Manning Publications Co. David M. Dietz, Christopher D. Barr, and Mine Cetinkaya-Rundel (2015). OpenIntro Statistics, American Institute for Mathematics.

ORAL COMMUNICATION (ENG 132)

Pre-Requisite: ENG 105

Course Description

This course provides instruction and experience in the preparation and delivery of speeches within a public setting and group discussion. Emphasis is on research, preparation, delivery, and evaluation of informative, persuasive, and special occasion public speaking. Upon completion, students should be able to prepare and deliver well-organized speeches and participate in a group discussion with appropriate audiovisual support. Students should also demonstrate the speaking, listening, and interpersonal skills necessary to be effective communicators in academic settings, in the workplace, and in the community.

Course Content

Paragraph writing, Essay writing, CV and job application, Study Skills, Academic Skills, Presentation skills

Reading Material

Trenholm, S. (2020). Thinking through communication: An introduction to the study of human communication. Routledge.

Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.

Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 019 435405 7

Writing. Upper-Intermediate by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 19 435406 5

Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.

BIOSTATISTICS (BSS 307)

Pre-Requisite: MAT 205

Course Description

To familiarize students with the statistical parameters necessary for the scientific presentation and drawing inferences of biological problems.

Course Content

Descriptive Statistics. Organizing and displaying data. Measures of Central Tendency. Measures of Dispersion and Variability. Curve Fitting. Probability. Simple and Multiple Regression. Simple and Multiple Correlation. Test of Hypothesis and Significance. Student "t", "F" and Chi-Square Distributions. Analysis of Variance.

Lab. Work:

Exercises may be given

Reading Material

Wu, J. (2020). Syllabus: Introduction to Biostatistics, EPBI 5002 (Spring 2020). Textbook Affordability Project (TAP).

Chaudhry, S. A., and Kamal, S. 1996. *Introduction to Statistical Theory*. Part- I and Part II, Ilmi Kitab Khana, Urdu Bazar, Lahore.

Daniel, W. W. 1983. *Bio-Statistics*. Foundation for Analysis in Health Science. 3rd Ed.

Harvey, M. 1995. *Intuitive Biostatistics*. Oxford University Press. NY.

Kuzma, J.W. and Bohnenblust, S.E. 2001. *Basic Statistics for the Health Sciences*. McGraw-Hill International Education.

Nilton, J. S. and Tsokos, J. D. 1983. *Statistical Methods in Biological and Health Sciences*. McGraw-Hill.

Onton, P., Adams, S. and Voelker, D.H. 2001. *Cliff notes for Statistics*. Blackwell Scientific publishers.

Pacano, M. and Gauvreau, K. 2000. *Principles of Biostatistics*.

Quinn, G. 2002. *Experimental Design and Data Analysis for Biologists*. Cambridge University Press.

Rosner, B. 2005. *Fundamentals of Biostatistics*. John Wiley & Sons.

Samuels, M. 1991. *Statistics for the life sciences*. Dellen Pub Co SF, USA.

Samuels, M. L. and Witmar, J. A. 2003. *Statistics for Life Sciences*. 3rd Edition. Cambridge University Press.

Walpole, R. E. 1982. *Introduction to Statistics*. Macmillan Pub Co, NY.

Zar, J. H. 1984 *Biostatistical Analysis*. 2nd Ed Prentice Hall the USA

INFORMATION TECHNOLOGY SKILLS (ITC 101)

Course Description

Introduction to Computers and Applications will introduce the students to basic computer hardware and processing concepts using Windows-based applications. The course will include basic computer literacy and Windows unit, a unit on the Internet using Internet browser, a word processing unit using Microsoft Word latest edition, a spreadsheet unit using Microsoft Excel latest edition, a database unit using Microsoft Access latest edition, and a presentation software unit using PowerPoint latest edition.

Course Content

Computers, Devices, and the Web
Programs and Apps
Connecting and Communicating Online
Digital Security, Ethics, and Privacy
Management of Windows and Office (latest edition)

Reading Material

Rainer, R. K., & Prince, B. (2021). Introduction to information systems. John Wiley & Sons.
Steinberg, G., Introduction to Computer Information System, 1st Ed. 2018.
Kendal/Hunt. Fundamentals of Computing, 3rd edition. ISBN: 978-0-8556-2 Customized e-book, available at book and from publisher's website – <http://www.khwebcom.com/fundofcomputing>.

INTRODUCTION TO SOCIOLOGY (HSS 202)

Course Description

The course offers an introduction to the basic nature of society and the relationship between society and the individual. This course focuses on how society functions and is organized, and how society impacts and influences individual motivation, understanding, action, and well-being. Basic sociological ideas regarding social relations, social interaction, social structure, and social change are examined. Students are introduced to key issues addressed by contemporary sociologists; class, race, gender, sexuality, religion, globalization, education, health care, crime, the media, and the environment. The knowledge gained in this course will aid students in future studies within a variety of fields and careers and encourage the development of critical thinking about important issues.

Course Content

Introduction to sociology and the sociological imagination, Methods to the madness & Culture and Media, Socialization and Reality & Groups and Networks, Social Control and Deviance, Stratification, Gender & Race, Poverty & Health and Society, Capitalism and the Economy, Authority and the State & Religion, Science, the Environment, and Society, Collective Action, Social Movements, and Social Change.

Reading Material

Van Tubergen, F. (2020). Introduction to sociology. Routledge.
Conley, Dalton. 2011. You May Ask Yourself: An Introduction to Thinking Like a Sociologist. 2nd Edition. New York: W. W. Norton & Company. ISBN: 0393935175 or 978-0393935172

PAKISTAN STUDIES (101)

Course Description

The course provides a vision of historical perspective, government, politics, contemporary Pakistan, Factors leading to Muslim separatism, People and land, Muslim advent, Location, and Geophysical features, and the ideological background of Pakistan with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid e Azam Muhammad Ali Jinnah. Students will study the process of governance, national development, and issues arising in the modern age and posing challenges to Pakistan. They will also Global issues of War and Peace, Economic and political integration, Poverty, and the Status of human rights in Pakistan.

Course Content

Historical Perspective, Government and Politics in Pakistan, Contemporary Pakistan.

Reading Material

Burki, Shahid Javed. *State & Society in Pakistan*, The Macmillan Press Ltd 1980.

Akbar, S. Zaidi. *The issue in Pakistan's Economy*. Karachi: Oxford University Press, 2000.

Ziring, Lawrence. *Enigma of Political Development*. Kent England: WmDawson& sons Ltd, 1980.

Zahid, Ansar. *History & Culture of Sindh*. Karachi: Royal Book Company, 1980.

Afzal, M. Rafique. *Political Parties in Pakistan*, Vol. I, II & III. Islamabad:

National Institute of Historical and Cultural Research, 1998.

Sayeed, Khalid Bin. *The Political System of Pakistan*. Boston: Houghton Mifflin, 1967.

Haq, Noor ul. *Making of Pakistan: The Military Perspective*. Islamabad:

National Commission on Historical and Cultural Research, 1993.

FUNDAMENTALS OF ECONOMICS (ECO 101)

Course Description

The course will cover fundamental concepts of both macro-and microeconomics at the introductory level. Microeconomic aspects of the course include supply and demand; elasticity; market efficiency; the cost of production; and profit maximization in competitive and monopolistic markets. Macroeconomics aspects include national income accounting; unemployment; inflation; Long-run and short-run aggregate demand and supply curves; economic growth and international trade.

Course Content

Elementary microeconomics.

The economic problem.

Supply and demand.

Elasticity.

Marginal analysis of consumers' and firms' behaviour.

The theory of profit maximization.

Analysis of markets.

Pricing in competitive and non-competitive markets

Reading Material

Boland, L. A. (2020). *The foundations of economic method: a Popperian perspective*. Routledge.

Mankiw, *Principles of Economics*, 7th Ed, 2008, Southwest Publishers.

Pindyck and Rubinfeld, *Microeconomics*, 9th Ed, 2018, Pearson.

Basu, K. *Analytical Development Economics: The Less Developed Economy Revisited*. 1st Ed, 2003, Cambridge, MIT Press.

RESEARCH & PROJECT WRITING METHODS (MRM 302)

Course Description

This course will provide students with a strong foundation in the conceptualization and operationalization of research, how to design a research project and 'hands-on' skills in the utilization of different research methods. Students will be exposed to a wide range of research methods and will learn the key principles of research design. Topics to be covered in detail include sampling, surveying, interviewing, case study analysis, focus groups, and analyzing and presenting data. Intellectual and methodological debates will be discussed to assist students to develop informed opinions and a critical appreciation for others' research. The imperative for ethical research practice will be presented. Students will be equipped with the knowledge and ability to

undertake methodologically sound, original research projects and will develop a set of transferable workplace skills.

Course Content

Meaning of research, Literature reviews and database searches, Writing workshop Online activity this week Formative Writing task, Research Ethics and Engaging Cultures Writing an ethics application, Theoretical Approaches, Qualitative Methods, Quantitative Methods, Research Analysis, Journal work, writing a research project, Verbal Presentations on research proposals.

Reading Material

Booth W., Colomb G. and Williams J., *The Craft of Research*, Second edition. Chicago: Chicago UP, 2003.

Ranjit Kumar, *Research Methodology A Step-by-Step Guide for Beginners*, 5th Ed., University of Western Australia, Australia, SAGE.

Uwe Flick, *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*, 2nd Ed., SAGE.

W Creswell, *Research Design.: Qualitative, Quantitative, Mixed Methods Approaches*, 2016.

W. Creswell, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 3rd Ed., ISBN-13: 978-1412995306 ISBN-10: 9781412995306

Judith Bell, *Doing Your Research Project (Open Up Study Skills)*, 5th Ed., Paperback 2010, ASIN: B008GSHDE4

INTRODUCTION TO MARINE SCIENCE (CMS 301)

Course Description

To understand the basics of Marine Science, its biological, geological, chemical, and physical characteristics and interrelationship.

Course Content

History of Marine Science, the basic structure of the earth, plate tectonics and ocean basins, Basics of Ocean Chemistry, Basics of Ocean Physics, Climate System, Waves, Tides and Ocean currents, Life in the Oceans, Marine Ecology, Plankton, benthos, Nekton, Food chains, and food webs. Oceanic Resources, Marine Pollution, Maritime Activities.

Reading Material

Field, J. G., Hempel, G., & Summerhayes, C. P. (Eds.). (2013). *Oceans 2020: science, trends, and the challenge of sustainability*. Island Press.

Deacon, M. (2018). *Scientists and the sea, 1650–1900: a study of marine science*. Routledge.

Anonymous, *Compendium on UN Law of the Sea*.

Anonymous, *Guidelines for Offshore Marine Operations*.

Gross, G., *Oceanography: A view of the Earth*.

Pinet, P.R., 1992. *Oceanography, An Introduction to the Planet Oceanus*.

P. S. Meadows, J. I. Campbell, 2012. *An Introduction to Marine Science*.

Tom, S., *Oceanography: An Invitation to Marine Science*, 9th Edition, Garrison Orange Coast College, ISBN-10: 1305105168| ISBN-13: 9781305105164, 640pp.

Weyl, P.K., *Oceanography, An introduction to the Marine Environment*.

John Morrissey, James Sumich, 2012. *Introduction to the Biology of Marine Life*

Fauville, G., Payne, D. L., Marrero, M. E., LANTZANDERSSON, A., & Crouch, F. (2019). *Exemplary practices in marine science education*.

Cock, J. M., Tessmar-Raible, K., Boyen, C., & Viard, F. (Eds.). (2010). *Introduction to marine genomics (Vol. 1)*. Springer Science & Business Media.

MARINE ECOLOGY AND ECOSYSTEMS (CMS 303)

Course Description

To understand the basic functional definition of ecology and ecosystem.

Course Content

Abiotic and biotic components of an ecosystem, Habitat, and zonation. Primary Production, factor affecting primary productivity. The consumer in the marine environment: Dynamics of populations, competition, Feeding and response, Food selection, Processing of conserved energy. Structure and dynamics: Marine communities, Trophic structure, Taxonomic structure, social structure, colonization, and succession. The function of the marine ecosystem: Nutrient cycling, Seasonal changes, Long-term and large-scale changes.

Lab. Work:

Field trips and reports, case studies of coastal ecosystems.

Reading Material

- Kon, K., Shimanaga, M., & Horinouchi, M. (2020). Marine ecology: intertidal/littoral zone. In Japanese Marine Life (pp. 241-254). Springer, Singapore.
- Speight, M. R., & Henderson, P. A. (2013). Marine ecology: concepts and applications. John Wiley & Sons.
- Kaiser, M. J., Attrill, M. J., Jennings, S., Thomas, D. N., & Barnes, D. K. (2011). *Marine ecology: processes, systems, and impacts*. Oxford University Press.
- Salvanes, A. G. V., Devine, J., Jensen, K. H., Hestetun, J. T., Sjøtun, K., & Glenner, H. (Eds.). (2018). *Marine ecological field methods: a guide for marine biologists and fisheries scientists*. John Wiley & Sons.
- Barnes, R.S.K., Stephen, R., Barnes, K. and Hughes, R.N., 1999. An Introduction to Marine Ecology. Wiley-Blackwell.
- Connell, S.D. and Gillanders, B.M., 2007. Marine ecology. Oxford University Press.
- Raffaelli, D.G. and Hawkins, S.J., 1999. Intertidal Ecology. Springer Verlag.
- Speight, M.R. and Henderson, P.A., 2010. Marine Ecology: Concepts and Applications, Willey and Blackwell.
- Stephen, R., Barnes, K. and Mann, K.H., 1991. Fundamentals of Aquatic Ecology. Willey and Blackwell.
- Tait, R.V., Butterworth, F.D. and Heinemann, 1998. Elements of Marine Ecology.
- Valiela, I., 1995. Marine Ecological Processes. Springer.

INTRODUCTION TO METEOROLOGY & OCEANOGRAPHY (MTM 120)

Course Description

This course is a foundation earth science course on meteorology and oceanography. Its objective is to provide students with a basic knowledge of atmospheric and ocean processes. Earth's energy budget, atmosphere moisture, and cloud development. Global wind systems, thunderstorms, and tornadoes. Seawater properties, atmosphere-ocean interaction, ocean currents, tides and waves. On completion of the course, the students will be able to understand the dynamics of the ocean and the atmosphere.

Course Content

Introduction and the earth and its atmosphere, Energy, Energy balance. Temperature distribution, Atmospheric moisture, Condensation, Atmospheric stability, Cloud development, Atmosphere in Motion, Global wind systems, Thunderstorms and Tornadoes, Introduction to Oceanography,

History of voyaging, Properties of seawater, The Atmosphere and the Oceans, Circulation pattern and ocean current, Tides and waves.

Reading Material

Ralph, F. M., Dettinger, M. D., Rutz, J. J., & Waliser, D. E. (Eds.). (2020). *Atmospheric Rivers* (Vol. 1). Springer International Publishing.

Beer, T. (2017). *Environmental Oceanography*. CRC Press.

Ahrens, C. D., *Meteorology Today: an introduction to weather climate and the environment*, 7th edition, Thomson Learning Inc, 2002.

Garrison, T., *Essentials of Oceanography*, 3rd edition, Thomson Learning Inc, 2004

Sverdrup, K.A., Duxbury, A.B. and Duxbury, A.C., *Fundamentals of Oceanography*, 5th edition, McGraw-Hill Companies Inc, 2006

PHYSICAL & GENERAL GEOLOGY (GEO 105)

Course Description

This course is designed to acquire knowledge about the basic concepts of Geology. This will help the students to get knowledge about various types of rocks and minerals and the processes of their formation.

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 groundwater; minerals; energy resources hydrocarbons & geothermal; Geological Eras, Weathering, and erosion; Sedimentation; Glaciations, Fossils, volcanism & Environments; theory of plate tectonics; Laboratory exercises in the identification of common minerals and rocks; and interpretation of topographic maps; Field trips to nearby geological localities.

Lab. Work:

Study of relief features with the help of models and topographic maps. Identification of rocks and minerals.

Reading Material

Stüwe, K. (2002). *Geodynamics of the Lithosphere* (p. 449). Berlin: Springer.

Skinner, B. J., Porter, S. C., Park, J. J., & Levin, H. L. (2000). *The dynamic earth: an introduction to physical geology*. New York: Wiley.

Jain, S. (2014). *Fundamentals of physical geology*. Springer India.

Bennison, G.M., 1997. *An Introduction of Geological Structures and maps*. Edward Arnold.

Holmes, A., 1978. *Principles of Physical Geology*. Nelson.

Jones, Norris. W., Johnes, Charles E., 2005. *Lab. Manual for Physical Geology*, McGraw-Hill.

McClay, K.R., 1987. *The Mapping of Geological Structures*. Open University Press.

Park, R.G., 1983. *Foundation of Structural Geology*. Blackie.

Platt, J.I., 1961. *Elementary Exercises upon Geological Maps*. Thomas Murby & Co.

Plummer, McGeary & Carlson, 2005, *Physical Geology*.

Smith, G. and Pun, A., 2006. *How Does Earth Work: Physical Geology and Process of Science*, Prentice-Hall.

SOCIO-ECOLOGICAL FUNDAMENTALS OF COASTAL ZONES (CMS 609)

Course Description

To consolidate their understanding of the terminology used in ecology and to understand key ecological processes of high relevance and application in integrated coastal management. The course will identify and categorize the role and functions of natural ecosystems and their provision of ecosystem services and benefit to man, and understand how human impacts on ecosystems can change the status and value of these services.

Course Content

An introduction to the fundamental concepts of ecosystem-based management, a systems-analysis approach, a) plant-animal interactions; b) trophic relationships; c) population dynamics; and d) species life cycle strategies (vital to conservation management). Relationship between people and the environment. Public attitudes, perceptions, and beliefs influence coastal management decision-making. Relationship between a community and its natural resources. Overview of the multidisciplinary approach to coastal ecosystems management. Role of social sub-systems e.g. culture, economic structure, demography, etc. Millennium Ecosystem Assessment (MEA, 2005). How do they relate to coastal ecosystems and ICM?

Reading Material

Paolisso, M., Prell, C., Johnson, K. J., Needelman, B., Khan, I. M., & Hubacek, K. (2019). Enhancing socio-ecological resilience in coastal regions through collaborative science, knowledge exchange and social networks: a case study of the Deal Island Peninsula, USA. *Socio-ecological practice research*, 1(2), 109-123.

Ecological Principles. Global Species Program: how WWF classifies species. Keystone Species.

Mann, K.H., 2000. *Ecology of Coastal Waters: With Implications For Management*, 2nd Edition. Wiley-Blackwell, UK. 432 pp.

Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Wellbeing: Synthesis*. Island Press, Washington, DC. 137 pp.

INTRODUCTION TO CLIMATE CHANGE (ENV 236)

Course Description:

Global mean surface air temperatures over land and oceans have increased over the last 100 years. Temperature measurements in the oceans show a continuing increase in the heat content the oceans. Analyses based on measurements of the Earth's radiative budget suggest a small positive energy imbalance that serves to increase the global heat content of the Earth system. Observations from satellites and in situ measurements show a trend of significant reductions in the mass balance of most land ice masses and Arctic sea ice. The oceans' uptake of CO₂ is having a significant effect on the chemistry of seawater. Paleoclimatic reconstructions have helped place ongoing climate change in the perspective of natural climate variability. This introductory course presents the Earth's climate system and explores the science and related issues of global climate change.

Course Content

Principle of climate change, Earth's energy budget. Climate change trends, Earth's surface temperature, Earth's atmosphere, Carbon dioxide, and other Greenhouse gases, Carbon cycle, Earth's albedo, Radiative forcing and climate change, Atmospheric circulation and climate, World ocean, Ocean heat content, and rising sea level, Glaciers and latest ice age, Permafrost and

methane, continents and mountain ranges, climate classifications, climates of recent past, Projections of future climates.

Reading Material:

Hughes, S., Chu, E. K., & Mason, S. G. (2020). *Climate Change and Cities*. Oxford University Press.

Eggleton, T. 2012: A Short Introduction to Climate Change. DOI: <https://doi.org/10.1017/CBO9781139524353>.

Letcher, T., 2015. *Climate Change*, 2nd Edition. eBook ISBN: 9780444635358. Paperback ISBN: 9780444635242. Elsevier. Pp 632.

Barry, *Atmosphere, Weather, and Climate*.

Flannery, T., *The Weather Makers: Our Changing Climate and What it Means for Life on Earth*.

OCEANOGRAPHIC INSTRUMENTS AND METHODS (CMS 406)

Course Description

To understand the principles and function of the instruments used in oceanography.

Course Content

Introduction to the principles of the instruments, Brief account of the following: time and position measurements (clocks, time signals, ground- and satellite-based navigation, attitude sensors), data logging (analogue and digital recorders, telemetry, memory and recording, water properties measurements (temperature, conductivity, oxygen, optical properties, tracers, and dyes), seabed sampling (grabs, corers, ROVs, underwater cameras), current measurements (mechanical, acoustic, electromagnetic, optical, radar, drifters), pressure and sea-level measurements, mechanical technology (cables, winches, buoys, anchors).

Reading Material

Karnauskas, K. (2020). *Physical Oceanography and Climate*. Cambridge University Press.

Thomson, R. E., & Emery, W. J. (2014). *Data analysis methods in physical oceanography*. Newnes.

Talley, L. D. (2011). *Descriptive physical oceanography: an introduction*. Academic Press.

Baker, D.J., 'Ocean instruments and experiment design,' in *Evolution of physical oceanography*, ed. Laboratory Exercises in Oceanography 2nd Edition by Popkin, B.W, Gorsline, D.S, and Hammond, D.E., 1987, W.H. Freeman and Company. New York.

COASTAL AND MARINE SEDIMENTOLOGY (MTM 604)

Course Description

This course is designed to acquire knowledge about various types of sedimentary environments and processes. This will help the students to understand the dynamics and natural processes involved in the coastal and marine systems.

Course Outline:

Introduction to sedimentology, origin, transportation, and deposition of sediments. Sedimentary structures, their classification, morphology, and significance. Origin and classification of sedimentary facies. The provenance of sediments. Diagenesis. Concepts of sedimentary facies and facies associations. Physico-chemical controls of the sedimentary environments. In-situ deposition of evaporates, authigenic and biogenic sediments.

Reading Material

Davis Jr, R. A., & Dalrymple, R. W. (Eds.). (2011). *Principles of tidal sedimentology*. Springer Science & Business Media.

Perry, C., & Taylor, K. (Eds.). (2009). *Environmental sedimentology*. John Wiley & Sons.

Boggs Jr. S., 1992. Petrology of Sedimentary Rocks. Merril Publishing Co.
Prothero, D. and Schwab, F., 1996. Sedimentary Geology. W.H. Freeman & Co.
Reading, H.G., 1986. Sedimentary Environment and Facies. Blackwell.
Reineck, H.E. and Singh, I.B., 1980. Depositional Sedimentary Environments. Springer-Verlag.
Selly, R.C., 1988. Applied Sedimentology. Chapman & Hall.
Tucker, M.E. and Wright, V.P., 1990. Carbonate Sedimentology. Blackwell.

MARINE RESOURCES (CMS 401)

Pre-Requisite: CMS 301

Course Description

Broadening the scope of harvesting marine resources. Technological advancement in developing Conventional and non-conventional marine products. Sustainable utilization and development of marine resources.

Course Content

Identification of living and non-living resources on the coast, seabed, and offshore areas. Aggregates, sea salt. Gas hydrates are commercially important seabed minerals. Renewable energy from waves, tides, and currents. Sustainable development of coastal and offshore resources. Living resources i.e. sponges, crustaceans, molluscs, echinoderms, fish, turtles, mammals, seaweeds, and Mangroves. Plankton fisheries and pearl fisheries, exploration of local potential commercial species concerning regional fisheries.

Reading Material

Shin, H. J. (2020). Natural products from marine fungi. *Marine drugs*, 18(5), 230.
Gullett, W., Schofield, C., & Vince, J. (2011). *Marine resources management*.
Finkl, C. W., & Makowski, C. (Eds.). (2014). *Remote sensing and modelling: Advances in coastal and marine resources* (Vol. 9). Springer.
Falque, M., De Alessi, M. and Lamotte, H. 2002. *Marine Resources: Property Rights, Economics and Environment*.
Iversen, E.S., 1996. *Living Marine Resources: Their Utilization and Management*.

MARINE GEOLOGY (GEO 320)

Pre-Requisite: GEO 105

Course Description

To give a detailed overview of the structure, evolution, and geological processes of the ocean basin and continental margin. This course will enable the students to fully understand the marine environment, what dynamic processes shape the surface of the earth under the ocean surface, sedimentation processes, and sediment distribution on the seafloor.

Course Contents:

Coastal environment & Biodiversity, Coastal features, Development of marine geology, and the contribution of deep-sea drilling projects and ocean drilling programs. Hypsometry, topographic features of the ocean. Plate tectonics and seafloor 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, and deep-sea sedimentation. Methods and instrumentation in marine geology. Worldwide sea-level changes through time.

Reading Material:

Seibold, E., & Berger, W. (2017). *The seafloor: an introduction to marine geology*. Springer.
Keen, M. J. (2017). *An introduction to marine geology*. Elsevier.

Grotzinger, J., Jordan, T. H., & Press, F. (2010). Understanding earth. Macmillan.
 Erickson, J., & Kusky, T. M. (2009). Marine geology: exploring the new frontiers of the ocean. Infobase Publishing.

COASTAL ECOSYSTEM AND CLIMATE CHANGE (CMS 502)

Course Description

To explore how the predicted changes in climate during the present century may affect coastal ecosystems and to examine the likely impacts of climate change on mangroves and corals. To understand the basic concepts of climate change and resilience. To identify various ecosystem-based tools for climate change adaptation.

Course Content

Terms and definitions: IPCC and UNFCCC, Climate Change, Weather and Climate. Overview of a component of climate change covering principal components of global climate change that most affect coastal ecosystems: Carbon Dioxide, Acidification of the Oceans, Temperature, Sea Level Rise, Extreme Weather Events, and Changes in Precipitation. Introduction to Disaster Risk Reduction for coastal communities. Why do disasters matter to sustainable development? Disaster trends. Explain the definitions of disaster, disaster risk, and disaster risk reduction making the linkages to climate change. Case study analysis to understand disaster risk. Explore why ecosystems matter to reducing disasters, including a comparison of Eco-DRR and Ecosystems Based Approach.

Lab. Work:

Comparative analysis of ecosystem-based adaptation and engineering options. Other case studies are also available for lab exploration.

Reading Material

Canadell, J. G., & Jackson, R. B. (Eds.). (2021). Ecosystem collapse and climate change. Springer International Publishing.
 Kuwae, T., & Hori, M. (2019). Blue carbon in shallow coastal ecosystems. Blue Carbon Shallow Coast. Ecosyst, 1(10).
 IPCC., 2012. IPCC Special Report on Extreme Events, Summary for Policymakers.29.Geneva: Intergovernmental Panel on Climate Change First Joint Session of Working Groups I and II.
 McLeod, E. and Salm, R.V., 2006. Managing Mangroves for Resilience to Climate Change. IUCN, Gland, Switzerland. 64pp.
 Renaud, K. F., Sudmeier-Rieux and Estrella, M., 2015. The Role of Ecosystems in Disaster Risk Reduction, eds. Bonn: United Nations University. UN/ ISDR. Global Assessment Report. Geneva: UN/ISDR.
 Souter, D.W. and Linden, O., 2000. The health and future of coral reef systems. Ocean and Coastal Management 43:657-688.

OCEAN WAVES, TIDES, AND CURRENTS (MTM 610)

Course Description

This course provides information regarding ocean waves, tides, and currents and the use of instruments to measure them.

Course Content

Wave hydrodynamics: wave characteristics, simple harmonic wave, Laplace equation, potential flows, Small amplitude wave theory - Airy's solution, Finite amplitude waves-Stokes solution, wave celerity, particle orbits, short waves and long waves. Wave generation, Jeffrey's theory, Sverdrup and Munk theory, wave growth and propagation. Group velocity. Ocean tides: tide characteristics, theories of tide generation, harmonic analysis, tidal prediction, Renewable energy sources from

Ocean –Wave energy, tidal energy, and thermal energy. Wave forecasting – Sea and swell, significant wave, SMB method of wave forecasting, PNJ method of wave forecasting, co-cumulative spectrum, fetch limited and duration limited cases, swell forecasting, dispersion, angular spreading and the concept of wave forecasting filter. Tides and Currents.

Reading Material

Velarde, M. G., Tarakanov, R. Y., & Marchenko, A. V. (2018). The ocean is in motion. Berlin: Springer Oceanography.

Holthuijsen, L. H. (2010). Waves in oceanic and coastal waters. Cambridge university press.

Ippen, A.T., Coastal and Estuarine Dynamics.

McClellan, Elements of Physical Oceanography.

Neumann and Pierson, Introduction to principles of dynamic oceanography.

US Navy, Observing and forecasting of ocean waves – H.Q Pub. No. 603.

Valeem, E. E. and Tirmizi, S.M.A., 2011. Wave climate of northern Arabian Sea during southwest monsoon season near Karachi, Pakistan: Variation and analysis of wave characteristics. VDM Verlag Dr. Müller, 284 pp. ISBN. 10: 3-639-31657-6, ISBN. 13: 978-3-639-31657-5.

COASTAL ECOSYSTEM AND CLIMATE CHANGE (CMS 502)

Course Description

To explore how the predicted changes in climate during the present century may affect coastal ecosystems and to examine the likely impacts of climate change on mangroves and corals. To understand the basic concepts of climate change and resilience. To identify various ecosystem-based tools for climate change adaptation.

Course Content

Terms and definitions: IPCC and UNFCCC, Climate Change, Weather and Climate. Overview of a component of climate change covering principal components of global climate change that most affect coastal ecosystems: Carbon Dioxide, Acidification of the Oceans, Temperature, Sea Level Rise, Extreme Weather Events, and Changes in Precipitation. Introduction to Disaster Risk Reduction for coastal communities. Why do disasters matter to sustainable development? Disaster trends. Explain the definitions of disaster, disaster risk, and disaster risk reduction making the linkages to climate change. Case study analysis to understand disaster risk. Explore why ecosystems matter to reducing disasters, including a comparison of Eco-DRR and Ecosystems Based Approach.

Lab. Work:

Comparative analysis of ecosystem-based adaptation and engineering options. Other case studies are also available for lab exploration.

Reading Material

IPCC., 2012. IPCC Special Report on Extreme Events, Summary for Policymakers. 29. Geneva: Intergovernmental Panel on Climate Change First Joint Session of Working Groups I and II.

McLeod, E. and Salm, R.V., 2006. Managing Mangroves for Resilience to Climate Change. IUCN, Gland, Switzerland. 64 pp.

Renaud, K. F., Sudmeier-Rieux and Estrella, M., 2015. The Role of Ecosystems in Disaster Risk Reduction, eds. Bonn: United Nations University. UN/ ISDR. Global Assessment Report. Geneva: UN/ ISDR.

Souter, D.W. and Linden, O., 2000. The health and future of coral reef systems. Ocean and Coastal Management 43: 657-688.

INTRODUCTION TO COASTAL ZONE MANAGEMENT (MTM 222)

Course Description

This course will examine major trends and issues that are impacting the world's coastal and ocean resources. Scientific, economic, social, and political aspects of each issue will be discussed and case studies will be used to illustrate the challenge of linking good scientific data with regulatory and management decisions. Topics include offshore renewable energy facilities, marine aquaculture, coastal development, climate change, coastal hazards, and coastal pollution impacts. This course will give students an understanding of water resources management and protection.

Course Content

Characterization of the coasts and oceans, State of the world's Oceans: Trends and Issue, Marine Protected Areas (MPA), Coastal pollution: role of science and technology, Coastal hazards and urban ports, Global fisheries and aquaculture, Coastal Zone Management Issues: Land-Sea Linkages, Offshore Energy: fossil fuels or renewable sources, international Coastal Zone Management / Coastal Megacities, Coastal Tourism: benefits and impacts, Marine Mammals: Conservation and Protection, Climate Change Impacts on Coasts and Oceans,

Reading Material

Crossland Ch., Coastal Fluxes in the Anthropocene, ISBN-10 3-540-25450-1 Springer Berlin Heidelberg New York, 2005 (e-book)

Nick Harvey, Global Change and Integrated Coastal Management, ISBN-10 14020-3628-0 (e-book)

UNESCO (2006): A handbook of measuring the progress and outcomes of Integrated Coastal and Ocean Management.

Gordon, Jr.D.C., Boudreau, P.R., Mann, K.H., Ong, J.-E., Silvert, W.L., Smith, S.V., Wattayakorn, G., Wulff, F., Yanagi, T., 1996. LOICZ Biogeochemical Modelling Guidelines. LOICZ Reports & Studies, No.5, LOICZ, Texel, The Netherlands.

Christopher J. Crossland · Hartwig H. Kremer · Han J. Lindeboom Janet I. Marshall Crossland · Martin D.A. Le Tissier (2005): Coastal Fluxes in the Anthropocene, ISBN-10 3-540-25450-1 Springer Berlin, Heidelberg New York.

MARINE MICROBIOLOGY (CMS 402)

Course Description

Students will learn about the microbial world in seas and oceans, their role in the environment, importance in the marine food web.

Course Content

Introduction to marine microbiology: microbial environment, biological organization and evolution, the importance of microbes and their sizes, chemical & physical factors influencing microbial distribution and processes, marine microbial habitat; Methods in microbiology, cell structure, and function, physiological processes; Eukaryotic microbes (nanoplanktonic flagellates, dinoflagellates, ciliates, diatom, coccolithophorids, radiolarians, foraminifera, fungi), Prokaryotic microbes (virus, bacteria, and cyanobacteria, marine Archaea), Role of microbes in oceanic processes (primary productivity, carbon and nitrogen cycling), marine microbial loop, Eutrophication, Symbiotic Association, Harmful microbes (pathogens and toxin-producing) to human and marine organisms (fish and invertebrates), Marine microbes and human society.

Reading Material

Steffi, P. F., & Anburaj, M. R. R. (2020). A Textbook on Marine Microbiology.

Marine microbiology: ecology and applications, Colin B. Munn – 2004.

Marine microbiology John H. Paul – 2001.
 Marine microbiology Brian Austin – 1988.
 Marine microbiology Carol D. Litchfield – 1976.
 Alien ocean: anthropological voyages in microbial seas. Stefan Helmreich – 2009.
 Marine microbiology Abhijit, Mitra, Kakoli Banerjee – 2004.
 The living ocean: marine microbiology. E. J. Ferguson Wood – 1975.

MARINE BIOTECHNOLOGY (CMS 403)

Course Description

To acquaint students with recent advancements in the field of marine biotechnology and how molecular techniques may be applied for studying marine organisms and to provide basic concepts and significance of biotechnology as it is being used in the industry.

Course Content

Definition and history; foundations of biotechnology and interdisciplinary pursuit; introduction to marine microorganisms commonly used in industry and marine biotechnology; branches and/ or applications of biotechnology in medicine, agriculture (algae, fungi, food, livestock, and fisheries, *etc.*); primary and secondary metabolites (*e.g.*, antibiotics, organic acids, toxins, *etc.*); aquaculture techniques; marine microbes and phytoplankton/ flora of biotechnological importance; the role of marine microbes in global carbon cycling; recent progress in the discovery of drugs and enzymes from marine sources; the significance of microorganisms in food production, fermentation, pharmaceutical, and other industries; protection of biotechnological products; media and nutritional requirements of industrial organisms; safety in biotechnology; public perception of biotechnology; biotechnology and ethics; biotechnology and the developing world.

Lab. Work:

Isolation and screening of potential microbes from different environmental sources; lab-scale production of bacterial enzymes; lab-scale production of alcohol by yeast; the use of microbes in bioleaching; use of microbes in microbial enhanced oil recovery

Reading Material

Kim, S. K., & Venkatesan, J. (2015). Introduction to marine biotechnology. In *Springer handbook of marine biotechnology* (pp. 1-10). Springer, Berlin, Heidelberg.
 Daugherty, E., 2012. Biotechnology: Science for the New Millennium. 1st Edition, Revised; Paradigm Publication.
 Gal, Y.L., 2010. New Developments in Marine Biotechnology. Springer.
 Gal, Y.L., 2010. Marine Biotechnology I (Advances in Biochemical Engineering Biotechnology). Springer.
 Gal, Y.L., 2010. Marine Biotechnology II (Advances in Biochemical Engineering Biotechnology). Springer.
 Johansen, M.N., 2011. Microalgae: Biotechnology, Microbiology, and Energy. Nova Science Pub Inc.
 Okafor, N., 2007. Modern Industrial Microbiology and Biotechnology. 1st Edition; Science Publishers, USA.
 Ratledge, C. and Kristiansen, B., 2006. Basic Biotechnology. 2nd Edition; Cambridge University Press, UK.
 Smith, J.E., 2009. Biotechnology. 5th Edition; Cambridge Univ. Press.
 Thomas, J.A. and Fuchs, R.L., 2002. Biotechnology and Safety Assessment. 3rd Edition; Academic Press, UK.

COASTAL LAND RECLAMATION (MTM 607)

Course Description

To understand the mechanism and drivers of large-scale coastal land reclamation in Pakistan and Southeast Asia; environmental impacts of coastal land reclamation and strategies for ecological improvement.

Pre-Requisite: GEO 105

Introduction: Context, Challenges, and Design Saliency. Comparison of the land reclamation history and trend between the developed and the developing countries. The broader ecological impacts of coastal land reclamation. Involvement of landscape architects, planners, and ecologists in land reclamation. Landscape Planning and Design: Role of landscape architects and planners in the land use decision making; Opportunities for ecological improvements; Introduction to the case studies. Strategies and Feasible Design Solutions: Developer's perspective, proposing solutions based on a strong technicality, Land-fill substance, and its influences on design solutions. Phasing and Implementation: ecological goals; Integrating ecological phasing; Long term monitoring and maintenance plan for sensitive habitats.

Reading Material

Alongi, D. M. (2020). Coastal ecosystem processes. CRC press.

Abbott, M.B. and Price, W.A., 1993. Coastal, Estuarial and Harbour Engineer's Reference Book. CRC Press, 768 pp.

Hudson, B.J., 1980. Coastal Land Reclamation with Special Reference to Hong Kong.

Lo, K.F.A. and Gunasiri, C.W.D., 2014. Impact of Coastal Land Use Change on Shoreline Dynamics in Yunlin County, Taiwan. *Environments*, 1:124-136.

Phillips, A. J. and Knights, B., 1979. Estuarine and Coastal Land Reclamation and Water Storage. Lexington Books, 256 pp.

Sekitar, J.A., 1998. Environmental impact assessment guidelines for coastal and land reclamation. Dept. of Environment, Ministry of Science, Technology and the Environment, Kuala Lumpur, Malaysia, 768 pp.

MANGROVE COASTAL FOREST MANAGEMENT (MTM 608)

Course Description

This course gives important information about mangrove forest management along the coastal area. It will be useful for environmentalists and forest protection agencies for proper management and protection of the mangroves.

Course Content

Introduction to Forest Resource Management; History of Mangroves Management in Pakistan; Forest Resource Health, Safety, Assessment and Mapping; Management Planning; Essential Field Skills; Introduction to Forest Ecology; Soil properties, development, and organisms; ecology of the mangroves; Coastal Harvesting Systems; Introduction to Timber Cruising, Grading, and Scaling; Worksite Readiness Skills; Transportation of Dangerous Goods.

Reading Material

Kathiresan, K. (2020). *Biotechnological Utilization of Mangrove Resources*. Academic Press.

Clark, J., 1996. Coastal Zone Management Handbook. CRC/Lewis Publ., Boca Raton, Florida (USA), 694 pp.

Clark, J., 1998. Coastal Seas: The Conservation Challenge. Blackwell Science, Oxford, 134 pp.

GIZ, 2014. Mangrove Management: A manual for appropriate mangrove conservation and planting in the Mekong Delta, Published by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Hamilton, L.S. and Snedaker, S.C. (Eds.), 1984. Handbook for Mangrove Area Management. Honolulu, Hawaii: East-West Center, 123 pp.

McHarg, I., 1969. Design with Nature. The Natural History Press, Garden City, New York, 197 pp.

McNeely, J.A., 1988. Economics and Biological Diversity. IUCN, Gland, Switzerland, 236pp.

MARINE PROTECTED AREAS MANAGEMENT (CMS 613)

Course Description

To introduce the concept and global experiences of Marine Protected Areas (MPA) management, as applied to marine biodiversity conservation, fisheries management, and sustainable tourism.

Course Outline:

Defining MPAs, Role of MPAs in protecting marine biodiversity, Types, and categories of MPAs, Benefits from MPAs, Evidence of the positive impacts of MPAs, Best practice in establishing MPAs, MPAs and ICM, Zoning and MPAs, Use of GIS tools in marine spatial planning, Designing resilient MPAs and MPA networks, Case studies.

Recommended Books:

Anonymous, 2003. Commonwealth of Australia, The Benefits of Marine Protected Areas.

Anonymous, 2006. Scaling up Marine Management: The role of Marine Protected Areas. Washington, DC, The International Bank for Reconstruction and Development, The World Bank. 120.

Anonymous, 2008. Department for Environmental, Food and Rural Affairs. The Marine and Coastal Access Bill. The United Kingdom.

Anonymous, 2008. IUCN World Commission on Protected Areas (IUCN WCPA) Establishing resilient Marine Protected Area networks – Making it happen.

COASTAL RESILIENCE AND DISASTER RISK REDUCTION (CMS 608)

Course Description

To understand the concept and components of resilience for providing a conceptual framework for managing socio-ecological systems. To understand the basic concepts of disasters, disaster risk reduction, and resilience. To identify various ecosystem-based tools for reducing disaster risk and climate change adaptation.

Course Content

Importance of implementing resilience concepts, strategy building and planning, ecosystem services, and reduction of vulnerability in disasters. The importance of DRR in reducing sensitivity and exposure and establishing systems for detection, response, and recovery. How the integration of resilience data can secure and strengthen ecosystem service delivery, and promote the adaptation of ecosystems and economic activity? How data can support the development of adaptation action plans, measure and communicate changes over time etc. Introduction to Disaster Risk Reduction for coastal communities. Why do disasters matter to sustainable development? Disaster trends. Definitions of disaster, disaster risk, and disaster risk reduction make the linkages to climate change. Case study analysis to understand disaster risk. Why ecosystems matter to reducing disasters, comparison of Eco-DRR and Ecosystems Based Approach.

Reading Material

IPCC. 2012. IPCC Special Report on Extreme Events, Summary for Policymakers. 29. Geneva: Intergovernmental Panel on Climate Change First Joint Session of Working Groups I and II.

McLeod, E. and Salm, R.V., 2006. Managing Mangroves for Resilience to Climate Change. IUCN, Gland, Switzerland. 64 pp.

Renaud, K. F., Sudmeier-Rieux and Estrella, M., 2015. The Role of Ecosystems in Disaster Risk Reduction, eds. Bonn: United Nations University. UN/ ISDR. Global Assessment Report. Geneva: UN/ISDR.

Souter, D.W. and Linden, O., 2000. The health and future of coral reef systems. Ocean and Coastal Management 43: 657-688.

UNEP EBM guidance, EbA decision support framework

Marine Pollution and Control (MTM 224)

Course Description

This course provides a convenient solution and delivers a current, comprehensive knowledge of the overall framework governing marine pollution, including applicable regulations, compliance requirements, and related management strategies. It presents an integrated approach, analyzing the many sources of pollution, describing best practices for minimizing contamination, responding to accidents, and exploring legal ramifications throughout the maritime and offshore sectors.

Course Content

Pollution in Context: Causes and Effects, Governance, Regulations and Enforcement, Air Pollution and Greenhouse Gas Emissions, Ballast Water and Other Marine Pollutants, Oil Pollution and Offshore Activities, Measurement and Management Systems, Legal Issues, Including Insurance and Compensation.

Reading Material

Iliana Christodoulou-Varotsi, Marine Pollution Control: Legal and Managerial Frameworks, 2018, Taylor & Francis Ltd. ISBN10 1138856681

Jerome Williams, 1979. Introduction to Marine Pollution Control (Ocean engineering), John Wiley & Sons Inc, ISBN-10: 0471019046.

Natural Hazards and Management (MTM 603)

Course Description

Broadly, the course is designed to learn the collection and analysis of scientific data concerning natural hazards. To study the hazards, their history, trends, and definitions. How and why places are hazardous, including the human geographic processes that put people at risk. Understanding of human nature and responses to disasters, and how science can be applied in the face of such disturbance.

Course Content

Energy Sources & Earth Interior, Bathymetry and Plate Tectonics, Plate Tectonics & Earthquakes, Tsunami, Volcanoes, Bathy Charts, Earthquakes/ Volcanoes, Introduction of Atmosphere, its dynamics, Ocean Conveyor Belt, Ocean Dynamics, Ocean Storms, Ocean Waves, Waves as Hazards, Tides & Standing Waves, Ocean Currents, Hurricanes, Hurricane Dynamics, Hurricane Damage, Global Climate Change, Hurricane Forecasts, ENSO, Cooling and Warming, Anthropogenic Climate Change, Natural Climate Change.

Reading Material

Tomaszewski, B. (2020). Geographic information systems (GIS) for disaster management. Routledge.
Bryant, E.A., Natural Hazards.
Ebert, C.H., Disasters, An Analysis of Natural and Human-induced Hazards.
Hyndman, D. and Hyndman, D., Natural Hazards and Disasters.
Keller, E. A., and Blodgett, R. H., Natural Hazards; Earth's Processes as Hazards, Disasters, and Catastrophe.
Murck, B.W., Skinner B.J. and Porter S.C., Dangerous Earth, An Introduction to Geologic Hazards.

MARINE GEOPHYSICS (CMS 605)

Course Description

A wide spectrum of marine geophysical exploration methods has been developed in the last two decades. The range of applications extends from marine resource exploration to scientific investigations in the deep ocean. Introduction to Marine Geophysics course is designed to provide the student with knowledge of basic field skills in applied marine geophysics. The aim is to introduce the basic physical principles of offshore exploration and practical application to geophysical techniques. At the undergraduate level, marine science students will highly benefit from understanding the role of geophysics particularly in hydrocarbon and mineral exploration.

Course Outline:

Scope of Marine geophysics. Introduction to different geophysical techniques. Gravity, Magnetic, Electrical, and Seismic methods. High-resolution and low-resolution geophysical methods. Offshore Geophysical logging for resource evaluation. Instrumentation and Usages. Introduction to geophysical data acquisition, processing, and interpretation.

Reading Material

Applied Geophysics by W.M. Telford, L.P. Geldart R.E. Sheriff, 2010. Cambridge University Press; 2nd edition.
Introduction to Geophysical Exploration by Philip Kearey, Michael Brooks, Ian Hill; 2002, 3rd ed. Blackwell Scientific Publications, London.
Introduction to Well Logs and Subsurface Maps by Jonathan C. Evenick, 2008: PennWell Corp.; illustrated edition.
Introduction to Geophysical Prospecting by Dobrin, M.B. & Savit, C.H., 1988, McGraw Hill.
Basic Exploration Geophysics by Robinson, E.S. & Coruh, C., 1988, John Wiley and Sons.
Geophysical methods in geology by Sharma, P.V., 1987, Elsevier Scientific Publishing Company.

SEA LEVEL CHANGES AND COASTAL ZONES (MTM 605)

Course Description

The main aim is to understand the sea-level change processes and their effects on the coastal environment. How a coastal system responds to different sea-level variations scenarios. To understand the delicate and complex dynamics of coastal zones concerning the recent rise in sea level and associated coastal dynamics.

Course Outline:

Sea level changes and causes, Eustasy and Isostasy, Regional and global effects of sea-level changes. Effects of sea-level changes on shorelines. Sea level Processes and indicators. Changes in coastal

environments, Coastal dunes, Estuaries and Lagoons, and Deltas. Physical processes, Coastal ecosystem, Human activities, Coastal issues.

Reading Material

Brown, S. (2020). Introducing Sea Level Change.

Basco, D.R.1982. Surf Zone Currents. MR-82-7, Coastal Eng. Res. Centre, US Army.

Bird, E.C.F, 1984. Coasts, An Introduction to coastal geomorphology. Basil Blackwell.

Bird, E.C.F, 1985. Coastline Changes. Wiley Interscience.

Bird, E.C.F. and Schwartz, M.L. (eds.) 1985. The words Coastlines. Van Nostrand Rheinhold, New York.

Carter, R.W.G; 1988. Coastal Environments, An introduction to the Physical, Ecological and cultural systems of coastlines. Academic Press.

GIS & REMOTE SENSING (GEO 437)

Course Description

This course is designed to introduce principles, concepts, and applications of Geographic Information Systems (GIS) and Remote Sensing (RS): a decision support tool for planners and managers of spatial information and to obtain information on the earth from the decimeter level to km level locally and globally.

Course Contents:

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.

Lab. Outline

Introduction to ArcGIS, Exploring GIS Dataset in Arc Catalog, Working on vector data in ArcGIS (Scanning, Digitization, and Editing), Integrating GPS data in GIS Environment, Applications of GIS, ERDAS Imagine - Environment, Noise Corrections, Geometric Corrections, Radiometric Corrections.

Reading Material

Grekousis, G. (2020). Spatial analysis methods and practice: describe—explore—explain through GIS. Cambridge University Press.

Matt Duckham, Michael F. Goodchild, Michael F. Worboys, (2003) Foundations of Geographic Information Science, Tylor & Francis, NewYork, USA.

Michael N. Demers (2002) Fundamentals of Geographic Information System, John Wiley & Sons, Inc., Singapore.

Basanta Shrestha & Birendra Bajracharya (2000), GIS for Beginners, By ICIMOD, Kathmandu, Nepal.

Kang-tsung Chang (2002) Introduction to Geographic Information Systems, McGraw- Hill Company, New York, U.S.A.

W. G. Rees (2001) Physical Principles of Remote Sensing Cambridge University Press, United Kingdom. ISBN: 0521669480.

Robert A. Schowengerdt (January 15, 1997) Remote Sensing 2nd edition, Academic Press ISBN: 0126289816.

Thomas M. Lillesand & Ralph W. Kiefer (the Year 2000) Remote Sensing and Image Interpretation John Wiley & Sons, Inc.

James B. Campbell (1996) Introduction to Remote Sensing, The Guilford Press, New York, USA.

HYDROGRAPHIC DATA & SERVICES MANAGEMENT/ HYDROGRAPHY & NAVIGATION (MTM 402)

Course Description

The purpose of the course is to give the students comprehension of hydrography along with fundamentals of hydrographic surveying methods and measurement principles with a practical demonstration to enable students to participate effectively in various hydrographic surveying tasks.

Course Content

Definition of Hydrography; Importance of hydrographic surveying; Contributions of hydrography to Maritime Activities including support for Port Management, coastal engineering and offshore construction; Economic benefits of hydrography; Principles of Hydrographic Surveying; Geodesy (Ellipsoid, Geoid, Projections, Datum transformation, vertical datums and reference planes); Surveying equipment and their calibrations; Positioning (Basic knowledge, GPS, DGPS, RTK, Underwater positioning); Bathymetry (General, Single-beam, Multi-beam); Data acquisition and Processing using Single and Multi-beam echo-sounding systems and other sensors such as Side Scan Sonar, Sub-bottom Profilers, Sound velocity meter and Land Surveyor's equipment with its accuracies; DGPS Accuracy, Error detection, Statistics; Tides (Theory, Observations, Predictions and uses of Tidal information); Quality assurance; Project Management; Hydrographic Data management; Nautical Charting; National/ Port Hydrographic organizations with roles & responsibilities and National Hydrographic Service obligations under the SOLAS Convention.

Reading Material

Archuleta, C. A., & Terziotti, S. (2020). Elevation-derived hydrography—Representation, extraction, attribution, and delineation rules (No. 11-B12). US Geological Survey.

Anonymous, 2005. Manual on Hydrography. International Hydrographic Bureau, Monaco.

Anonymous, 2010, Manual on Hydrography. International Hydrographic Organisation (IHO), Publication C-13.

Anonymous, Geodesy: Introduction and Overview of Geodetic Datums available at the University of Colorado.

Anonymous, Guidelines of Good Practice for Hydrographic Surveys in New Zealand Ports and Harbours.

Anonymous, Hydrographic Survey Standards. IHO Special Publication.

Caspers, H., 1964. Hela, Ilmo, and Taivo Laevastu: Fisheries Hydrography. How Oceanography and Meteorology can and do serve fisheries. With 67 figs. London: Fishing News (Books) Ltd., 137 pp.

De Jong, C.D., Lachapelle, G., Skone, S. and Elema I.A., 2003. Hydrography. 2nd Ed., Delft University Press, NL, 353 pp.

Ingham, A.E. and Abbott, V.J., 1993. Hydrography for the Surveyor and Engineer. 3rd Ed., Wiley-Blackwell, 144 pp.

Lekkerkerk, H-J, 2011, Handbook of Offshore Surveying-Three Volumes Set, Skilltrade, The Netherlands.

MARINE BIODIVERSITY (CMS 505)

Course Description

To understand the structure and function of marine biodiversity components from genes to habitats and develop skills to carry out impact assessment and conservation.

Course Content

The structure and functioning of Marine Biodiversity (from genes to habitats) and with Impact studies and its relationship with the basic oceanographic processes. Toolbox for investigating marine biodiversity for attempting data analysis: experimental design, modelling, taxonomy, Evolution, Invasive species, data and Information Management, Field observations and interpretation, and Molecular methods; Molecular bar-coding of biodiversity, Conservation, Laws for conservation, Marine protected areas. Conservation and Restoration of marine 25 biodiversities and application of the above-mentioned theories and methods to develop sustainable use of the marine environment.

Reading Material

Marine Biodiversity: Patterns and Processes, Rupert F. G. Ormond, John D. Gage, Martin V. Angel - 2005 - 472 pages

The Living Oceans, B. Thorne Miller, Island Press, USA

Marine Conservation Biology: a science of maintaining the Sea's Biodiversity, E. Norse and L. Crowder. 1999. Island Press, USA

Marine biodiversity: patterns and processes, assessment, threats, management, and conservation. Henrique Queiroga. 2006 Springer.

COASTAL PROCESSES (CMS 507)

Course Description

Study the effects of seawater movement on the coastal sediments, the role of beach sediments in the protection of coasts, and anthropogenic activities that alter the beach profile.

Course Content

Waves, tides, coastal currents. Distribution of sediment on the beach. Beach drift, Factors responsible for coastal erosion, coastal accretion, classification of sediments, sediment budget, coastal sediment transport, and shoreline protection. Protection of chronically eroding beaches, types of hard stabilization for protection of coastal areas, and Natural beach nourishment. Anthropogenic activities, beach management. Set back limits. Shifting of beach dunes. Sediments pathways in the Deep sea sedimentation, Minerals in the sediments. Formation of deltas. Barrier island formation, Options for Management of Coastal areas.

Reading Material

Beuzen, T., & Splinter, K. (2020). Machine learning and coastal processes. In Sandy beach morphodynamics (pp. 689-710). Elsevier.

Brebbia, C.A., Benassai, G. and Rodriguez, G.R., Coastal Processes: Volume 126.

Coastal Processes: Concepts in Coastal Engineering and their Application to multifarious environment by Tomoya Shibayama.

Kjerfve, B., Coastal Lagoon Processes.

Kosian, R.D., Pykhov, N.V. and Edge, B.L., Coastal Processes in Tideless Seas.
McAnally, W.H. and Mehta, A.J., Coastal, and Estuarine Fine Sediment Processes.

OCCUPATIONAL HEALTH AND SAFETY, RISK AND DISASTER MANAGEMENT (MTM 533)

OBJECTIVES:

The course will provide information on occupational health and safety as well as it will review various types of workplace hazards, their exposure, and their effects on the body. The focus will be on hazardous chemicals, carcinogens, effects of chemicals on acute and chronic health problems related to work, and safe use of chemicals at work. Awareness will also be created about the health and safety laws and enforcement, the role of health and safety committees at work etc.

COURSE OUTLINE:

Introduction to occupational health and safety: Accidents, Disease, Normal working, Health and safety problems worldwide, Importance of management and training in occupational health and safety, with emphasis on maritime safety and practices. Common workplace-associated hazards; are biological, chemical, mechanical, physical, and psychological hazards and their effects on health and safety, local effects, systemic effects, and acute and chronic effects. Chemicals in the workplace, Noise at work, Manual handling, Controlling hazards: Methods of control, Elimination, Substitution, Engineering Controls, Administrative controls, Personal protective equipment (PPE), Cumulative trauma disorder (CTD), Evaluation of job risk factors, Controlling vibration hazards. Labour code of Pakistan. Occupational health safety management system. Legislation related to health and safety at work, Checklist, Role of the health and safety representatives and labour union at work; meetings, reports, training education, negotiation, Role of government, Health and safety committee.

RECOMMENDED BOOKS:

Occupational Health Hazards and Remedies. (2002). Mohapatra, R. Jaypee Brothers Medical Publishers Pvt. Ltd. India.
Biosafety Management: Principles and Applications. (2000). Aynor, P. L. Virginia Polytechnic Institute Publications. The USA.
Hazardous Chemicals Handbook. (2002). 2nded. Carson, P. and Mumford, C. Butterworth Heinemann. Oxford, UK.
Basic Environmental Health. (2001). 1sted. Yassi, A., Kjellstrom, T., deKok, T. and Guidotti, T. L. Oxford University Press. NY, USA.
Risk assessment of chemicals: An Introduction. 2007. Leeuwen, C.J.V. Springer, USA

PHYSICAL OCEANOGRAPHY & SURVEYING GEO-462

Pre-requisite: CMS 406

Course Description

This course is designed to introduce students to the important physical processes in the oceans in such a way that they will understand both the conceptual physical principles and on a larger scale how these fit into the earth as a system.

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 a 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.

Reading Material

Karnauskas, K. (2020). Physical Oceanography and Climate. Cambridge University Press.
 Anonymous, Compendium on UN Law of the sea.
 Gross, G., Oceanography: A view of the earth.
 Pickard, G.L. and Emery, W.J., Descriptive Physical Oceanography.
 Pinet, P.R., 1992. Oceanography: An Introduction to the Planet Oceanus.
 Sverdrup, Johnson and Fleming, The Ocean.
 Weyl, P.K., Oceanography, An introduction to the Marine Environment.

MARINE GEOCHEMISTRY (GEO 311)

Pre-Requisite: CHM 105

Course Description

The course has been designed to provide background for and exposure to current research in marine geochemistry to understand the role of physical, chemical, and biological processes in controlling chemical distribution in the marine environment.

Course Content

The geochemical cycle and the composition of ocean water; the transport of material to the ocean, nutrients, organic carbon, and carbon cycle in seawater; trace elements in the ocean, residence time and reactivity of elements; Composition of oceanic suspended matter; the geochemistry of marine sediments, sediment interstitial waters and diagenesis; organic matter production, accumulation and preservation; marine carbonates; isotopes in marine geochemistry; chemical characteristics of hydrothermal vent Fluids; geochemistry of ferromanganese deposits in the ocean; geochemical proxies and global environmental history; pollution in the sea; geochemical models.

Labs:

Exercises dealing with the determination of salinity, residence time, and reactivity of major elements, calculation of chemical fluxes, pale productivity, interpretation of geochemical proxies; geochemical analysis of marine sediments.

Reading Material

Middelburg, J. J. (2019). Marine carbon biogeochemistry: A primer for earth system scientists (p. 118). Springer Nature.
 Ocean Biogeochemical Dynamics by Sarmiento, J. L., and N. Gruber, 2006, Princeton University Press
 Marine Geochemistry by Schulz, H. D., and Zabel, M. (eds), 2002, Springer.
 Coastal upwelling: Its sedimentary record, Part B: Sedimentary records of ancient coastal upwelling by Thiede, J, and Suess, E (eds), 1983, Plenum Press. New York
 Modern and ancient continental shelf anoxia by Tyson, R.V and Pearson, T.H. (eds); 1991, Geol. Soc. Spec. Publ; 58, Blackwell, Oxford.

Organic matter: Productivity, accumulation, and preservation in recent and ancient sediments by Whelan, J.k and Farrington, J.W. (eds), 1992, Columbia University Press. New York.

COASTAL ENGINEERING (CMS 304)

Pre-Requisite: MTM 222

Course Description

The course is based on developing an understanding of the theory and application of waves, tides, and sediment transport and their application in the nearshore coastal zone. Other topics include nearshore processes, statistical modelling of return periods, offshore outfalls, beach protection, wave generation, harbour design, and coastal management.

Course Content

Key elements of this course include wind waves - their generation and transformation processes, coastal hydrodynamics and transport processes, coastal water level fluctuations (short-term and long-term), and governing processes on beach/barrier, deltaic, wetland, and estuarine environments. Introductory concepts in coastal morphodynamics, coastal accretion, deltaic and estuarine sedimentation, marsh edge erosion, longshore transport and shoreline change, run-up and inundation over wash during storms, and inlet barrier interactions. Ocean waves along the coast, wave statistics, wave refraction, wave diffraction, wave shoaling, wind and wave generation, tides and tidal currents, sand migration, coastal erosion and erosion control, and erosion around structures due to waves and currents. Types of Coastal Protection. Hard & Soft Protection.

Reading Material

Nielsen, P. (2009) Coastal and Estuarine Processes. Advanced Series on Ocean Engineering, Volume 29, World Scientific, 343pp.

Sorensen, R.M. (2006) Basic Coastal Engineering, 3rd Edition. Springer, 324pp.

Reeve, D.; Chadwick, A. and Fleming, C. (2004) Coastal Engineering Processes, Theory, and Design Practice. Spon Press, 461pp.

U.S. Army Corps of Engineers (1984). Shore Protection Manual. Volumes I and II.

MARINE ACOUSTICS (MAC 500)

Course Description

This course introduces the physical principles underlying acoustic Propagation in the sea and describes key applications. It draws on the internationally recognized marine acoustics program.

Course Content

Background material; Noise in the ocean; Ray acoustics; Deepwater acoustic propagation; Wave acoustics; Shallow water acoustic propagation; Devices for sound production and reception underwater; Sound production and reception by marine animals; Use of sound by marine animals; Impacts of man-made noise; Marine resource estimation; Marine environmental assessment; Defence applications of underwater acoustics; Commercial applications of underwater acoustics.

Reading Material

Blue, J.E. and Medwin, H., 2005. *Sounds in the Sea: From Ocean Acoustics to Acoustical Oceanography*. Cambridge University Press, 643 pp.

Buchanan, J.L., Gilbert, R.P., Wirgin, A. and Xu, Y., 2004. *Marine Acoustics: Direct and Inverse Problems*. SIAM, 347 pp.

Fish, J.P., 1989. *Unfinished Voyages*. Woods Hole, USA.

Hovem, J., 2010. *Marine Acoustics*. Peninsula Publishing, 656 pp.

Lurton, X., 2002. *An Introduction to Underwater Acoustics: Principles and Applications*. Springer.

OCEAN DYNAMICS (MOD 606)

Course Description

This course aims to help students, acquire an understanding of some of the basic concepts of fluid dynamics that will be needed as a foundation for advanced applications in the ocean and atmospheric sciences and ocean engineering, *etc.* The emphasis is on fluid fundamentals, but with an atmosphere/ ocean twist.

Course Content

Introduction to Fluid Dynamics, Kinematics of Fluid Flow, Eulerian and Lagrangian Representations of Flow, The Material Derivative Trajectories, Streaklines, and Streamlines, Cauchy-Stokes Theorem, The Velocity Gradient Tensor, Vortex Flows, Circulation, and Vorticity, Equations of motion of frictionless ocean currents; scale analysis, barotropic and baroclinic approximation; geostrophic currents in a stratified ocean, the 2 layer approximation and White-Margules equation; gradient currents and mass stratification; relative currents and slope currents; Ekman's theory, Sverdrup, Stommel and Munk's theories; Waves, Beta Effect, Wave Kinematics Barotropic, Fixed Depth Rossby Waves, Shallow Water Equations, Shallow Water Gravity Waves, Inertia-Gravity Waves, Kelvin Waves, Rossby Waves, upwelling and sinking with special reference to the Indian ocean.

Reading Material

Cushman-Roisin, B., 1994. *Introduction to Geophysical Fluid Dynamics*. Prentice-Hall, 320 pp.
 Gill, A. E., 1982. *Atmosphere-Ocean Dynamics*. Academic Press, 662 pp.
 Holton, J. R., 1972. *An Introduction to Dynamic Meteorology*.
 Kundu, P.K. And Cohen, I.M., 2016. *Fluid Mechanics*. Academic Press, 750 pp.
 Pond, S. and Pickard, G.L., 1983. *Introductory Dynamical Oceanography*. 2nd Ed., Butterworth-Heinemann, 349 pp.
 Tritton, D. J., 1988. *Physical Fluid Dynamics*. Clarendon Press, 544 pp.

ENVIRONMENTAL IMPACT ASSESSMENT (CMS 604)

Objectives:

An environmental impact assessment (EIA) is an assessment of the possible impact - positive or negative - that a proposed project may have on the environment, consisting of the natural, social and economic aspects with a special focus on coastal installations.

Course Outline:

Introduction and principles, nature, and procedures (IEE, EIS, SEA, EIA). Purpose of environmental impact assessment concerning coastal/marine environment. National Environmental Laws, International Conventions, and Protocols relevant to EIA. Scoping and Public Participation. Marine Baseline Surveys (Flora and Fauna), Coastal and marine ecology/ ecosystems, geomorphology of the coast, ocean dynamics, air, and noise about coastal areas. Risk analysis and management, mitigation measures, and Environmental Management Plan with relevance to the project.

Recommended Books:

Bai, Y., 2003. *Marine Structural Design*. Elsevier.
 Barthwal, R.R., 2002. *Environmental Impact Assessment*. New Age International.
 Gilpin, A., 2005. *Environmental Impact Assessment (EIA): cutting edge for the twenty-first century*. Cambridge University Press.
 Glasson, J., Therivel, R. and Chadwick, A. 2005. *Introduction to Environmental Impact Assessment*. Taylor & Francis.

- Glasson, J., Therivel, R. and Chadwick, A., 2005. Introduction to Environmental Impact Assessment. Taylor & Francis.
- Morris, P., 2009. Methods of Environmental Impact Assessment. Taylor & Francis.
- Petts, J., 1999. Handbook of Environmental Impact Assessment. Wiley-Blackwell.
- Wathen, P., 2005. Environmental Impact Assessment: theory and practice. Routledge.

FISHERIES RESOURCES & MANAGEMENT (MTM 322)

Course Description

Introduce the importance and scope of fishery industries in the national economy. The subject areas cover the concept of sustainability and fish stock assessment at the national, regional & international levels. This course provides an introduction to the biology and ecology of a range of marine species (fish, crustaceans, and molluscs) that are targeted by both commercial and recreational fisheries. Students will gain knowledge of behaviour, early life history, population dynamics, habitat utilization, and trophic relationships relevant to understanding issues associated with exploitation and management. The course will introduce students to techniques used in fisheries science and will examine human impacts on, and management of, Australian marine populations. Students will also acquire an understanding of the present and future needs of, and prerequisites for, aquaculture and Deep Sea Fishing.

Course Content

Introduction to Biology and Ecology of Marine Vertebrates and Invertebrates: Reproduction and early life history, Age and growth, Habitat use, migration, and movement, Feeding ecology and trophic relationships, Population dynamics, Factors affecting the fish distribution and abundance, Fisheries Management and Conservation: Stock assessment and stock-recruitment, Catch Per Unit Effort (CPUE) and sustainability, Methods of harvesting, Managing fisheries and marine habitats, Use of fisheries models as management tools, Marine Protected Areas, Aquaculture, deep-sea fishing methods.

Reading Material

- Charles, A.T., Sustainable Fishery Systems. 2001, Wiley-Blackwell, London.
- Haddon, M., Modelling and Quantitative Methods in Fisheries, 2001, Chapman and Hall, London.
- Gene S. Helfman. (2007). Fish Conservation: A Guide to Understanding and Restoring Global Aquatic Biodiversity and Fishery Resources

SATELLITE OCEANOGRAPHY (CMS 508)

Objectives:

This course provides an introduction to Satellite Oceanography to substitute onboard instruments to record various parameters of oceans.

Course Outline:

Physical Principles of Remote Sensing; Satellite Orbits; Sensors for forecasting the Ocean; Remote Sensing Program for satellite Meteorology and Oceanography; Principles of Image Processing; Passive sensors; Ocean colours and Remote Sensing; Passive microwave radiometers; Comparison between infrared and microwave radiometers for SST measurement; Air-Sea Interaction studies

using satellite data; Radars, sea surface roughness, and Scatterometry; Radar Altimeters from the Ocean; Synthetic Aperture Radar imaging of Ocean.

Recommended Books:

Kidder, S.Q. and Haar, T.H.V., 1995. Satellite Meteorology an Introduction. Academic Press, x + 466 pp.

Robinson, I.S., Measuring the Oceans from Space.

Satellite Oceanography- An Introduction for Oceanographers and Remote sensing scientists.

Discovering the Ocean from Space: The unique applications of satellite oceanography (Springer Praxis Books) 2010 Edition by Ian S. Robinson.

Introduction to satellite oceanography Paperback – 2012 by G.A. Maul

LAUNCH PROPOSAL – BACHELOR OF REMOTE SENSING & GIS AT BSEAS-IC

A	Academic Details
1	Faculty/Department: Bahria School of Engineering and Applied Sciences, Department of Earth and Environmental Sciences, Bahria University H-11 Campus's Islamabad
2	Name of the Programme: Bachelor of Remote Sensing & GIS (BS RS & GIS)
3	Mission of the Programme: To prepare students who can learn emerging knowledge of Remote Sensing and GIS and develop their skills to serve in interdisciplinary research projects using geospatial sciences.
4	Objectives of the Programme (Programme Education Objectives) <ul style="list-style-type: none"> • To provide understanding of Remote Sensing and Geographical Information System (GIS) through theory, practical work/lab and field exercises using modern tools and techniques. • To provide computing, mathematical and logical skills critical for solving problems through Thesis/internship in technological projects. • To augment team work ethics for any industrial project. • To develop effective presentation, oral and written communication skills
5	Outcomes of the Programme: Graduates capable of fulfilling developmental and research needs in the domain of Remote Sensing and GIS.
6	Rationale for the Programme: The Department of Earth & Environmental Sciences (BSEAS-IC H-11 Campus) has proposed to offer 4-years <i>BS in RS & GIS</i> programme; designed to provide a platform for students getting knowledge about emerging geospatial technologies including Remote Sensing and GIS . This programme provides a foundation to focus on the application of the Remote Sensing and GIS technologies for the management of Pakistan's natural and environmental resources. The Dept of E&ES is aimed that young scientists utilize the knowledge and skills of these disciplines towards identification and mitigation of the most profound challenges in the domains of RS and GIS applications through research initiatives. It is envisioned that the graduates of <i>BS in RS & GIS</i> may find their possible careers over a wide canvas that includes the following: <ul style="list-style-type: none"> • Natural Resources and Environments (exploration, monitoring, management) • Geosciences (minerals exploration, earthquake, tsunami mapping) • Water Resources (river, lakes, flood mapping, monitoring, and prediction) • Social Sciences (crime monitoring, revenue collection, health care, elections) • Urban Planning (city planning, transportation & utility network planning) • Agriculture (crop planning, crop health monitoring, yield forecasting) • Meteorology and Climatology (monitoring, mapping, prediction) • Navigation and Tracking Applications (mapping and modeling) • Geographical location-based geospatial research projects etc.
7	Brief Description of the Programme: Curriculum of the <i>BS in RS & GIS</i> includes coursework in geography, remote sensing, GIS, computer sciences, modelling, and related courses. The courses are based on theoretical knowledge, practical, fieldwork, case studies and research thesis. The programme also encourages students to take courses in ethics and social responsibility, with the opportunity to participate in some of the internship programs at relevant organizations and industries to solve specific problems in various applications of both geospatial fields of Remote sensing and GIS.
8	Duration: 4 years

9	Venue(s): <input checked="" type="checkbox"/> On Site/Off Site/Both On & Off Site <i>(Tick one; if Off Site, give details)</i> Johar Block, BSEAS, Bahria University H-11 Campus, Islamabad										
10	Programme Scheduling Format: Morning; Annual intake										
11	Proposed Date of Commencement: Spring 2023										
12	Mode of Study/ Examination: On-campus/ online classroom teaching. The students' performance will be evaluated through Assignments, Quizzes, Mid-term, and Final Exams for each course in each semester. Students will be required to undertake a 6 x credit hours Thesis, considering their keen interest in any subdomain of Remote Sensing or GIS .										
13	Additional Faculty Member(s) Required: For intake of one batch per annum, at least 4 x faculty members are required for <i>BS in RS & GIS</i> programme. Following faculty members are already available, whereas the rest of the experienced FMs will be inducted as per the requirement: <ul style="list-style-type: none"> • Dr. Muhammad Iqbal Hajana, Snr Asstt Prof; Research Interests: Geosciences, GIS and RS, Water Resource Management • Dr. Fahad Mehmood, Snr Asstt Prof; Research Interests: Geophysics, Groundwater Modelling, GIS & RS, Earthquakes • Dr Maryam Saleem, Lecturer; Research Interests: Geology, GIS and RS. Total 5 x FMs are required after 6 th Semester (Year 3). Therefore, additional PFM will be inducted as per the following plan, along with 8 x core course for VFM offered in different semesters (1 st to 8 th semester). <table border="1" data-bbox="443 958 1279 1160"> <thead> <tr> <th>Year/ Semester</th><th>No of Faculty</th></tr> </thead> <tbody> <tr> <td>Year 1</td><td>3</td></tr> <tr> <td>Year 2</td><td>3</td></tr> <tr> <td>Year 3</td><td>3+1</td></tr> <tr> <td>Year 4</td><td>3+1</td></tr> </tbody> </table>	Year/ Semester	No of Faculty	Year 1	3	Year 2	3	Year 3	3+1	Year 4	3+1
Year/ Semester	No of Faculty										
Year 1	3										
Year 2	3										
Year 3	3+1										
Year 4	3+1										
14	Additional Skilled-Worker(s) Required: <i>(Indicate if there is a requirement for additional Skilled Staff, full-time/part-time, along with their qualifications/skill sets.)</i> <ul style="list-style-type: none"> • 01 Lecturer with MS in GIS/Remote Sensing will be required as PFM in third year (Spring 2025). He/She will teach 04 courses per semester. • 01 Lab Engineer is required and with research experience in the domains of GIS/RS in third year (Fall 2025). He/she will help to maintain the lab and assist research students. • VFM will be required to teach 08 core courses offered in different semesters (1st to 8th semester) 										
15	Additional Classroom(s) required*: Total of four classrooms will be required along with a computer lab, with the following breakdown for a complete program. <p>First Year: 2 Classrooms Second Year: 3 Classrooms Third Year: 3/4 Classrooms Fourth Year: 3/4 Classrooms</p> * Class rooms are already available. If the program is successful, extra classes will accommodate with other programme.										
16	Additional Requirement for Laboratories: GIS software and a computer lab are already present in the Dept of E&ES, BSEAS-IC.										
17	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: At least 100 books, journals, and resources are required.										
18	Minimum Entry Level: Minimum 50% marks in Intermediate (HSSC) Examination (Pre-Medical/ Pre-Engg/ ICS/ General Science/ Diploma of Associate Engineering) or equivalent qualification.										

	Deficiency: For Pre-Medical students, the following one deficiency courses of mathematics will be taught during the first year. Action: Course <i>Mathematics</i> (MAT 105) with 0 Credit Hours is already held to cater students having pre-medical back ground.																																																																																										
19	Admission Criteria: As per BU Policy related to Admission Matric/ O-level: 10% Intermediate/ A-level: 40% CBT/ Entry Test Score: 50%																																																																																										
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 consecutive two Intake: An effort will be made to enroll 20 students for the first two intakes (Spring 2023 and Fall 2023). However, for first two intakes the programme may be allowed to be started for 15 students.																																																																																										
22	Number of Admissions Planned/Expected for Subsequent Intakes: Minimum 20 admissions per intake.																																																																																										
23	Referred by: DBOS, FBOS																																																																																										
24	Complete Plan of Studies, inclusive of complete Roadmap: As given at (Appendage 4109) of 41 st ACM																																																																																										
25	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended): Course outlines for BS Remote Sensing and GIS Program are attached with this document for reference.																																																																																										
B	FINANCIAL DETAILS																																																																																										
1	Source of Funding: BU Fully																																																																																										
2	Degree Duration: 4 years Annual or Semester System: Semester																																																																																										
3	Expected fee to be charged based on Cost & Benefits Analysis (B3): Rs. 35,635,860/- <table><tr><td></td><td colspan="3">Student</td><td colspan="2">Fee Per Student</td><td colspan="3">Total Fee</td></tr><tr><td>Semester</td><td>Fresh</td><td>Existing</td><td>Total</td><td>Fresh</td><td>Existing</td><td>Fresh</td><td>Existing</td><td>Total</td></tr><tr><td>Spring 2023</td><td>15</td><td>-</td><td>15</td><td>108,954</td><td>-</td><td>1,634,310</td><td>-</td><td>1,634,310</td></tr><tr><td>Fall 2023</td><td>15</td><td>15</td><td>30</td><td>108,954</td><td>82,000</td><td>1,634,310</td><td>1,230,000</td><td>2,864,310</td></tr><tr><td>Spring 2024</td><td>-</td><td>30</td><td>30</td><td>-</td><td>82,000</td><td>-</td><td>2,460,000</td><td>2,460,000</td></tr><tr><td>Fall 2024</td><td>20</td><td>30</td><td>50</td><td>108,954</td><td>82,000</td><td>2,179,080</td><td>2,460,000</td><td>4,639,080</td></tr><tr><td>Spring 2025</td><td>-</td><td>50</td><td>50</td><td>-</td><td>82,000</td><td>-</td><td>4,100,000</td><td>4,100,000</td></tr><tr><td>Fall 2025</td><td>20</td><td>50</td><td>70</td><td>108,954</td><td>82,000</td><td>2,179,080</td><td>4,100,000</td><td>6,279,080</td></tr><tr><td>Spring 2026</td><td>-</td><td>70</td><td>70</td><td>-</td><td>82,000</td><td>-</td><td>5,740,000</td><td>5,740,000</td></tr><tr><td>Fall 2026</td><td>20</td><td>70</td><td>90</td><td>108,954</td><td>82,000</td><td>2,179,080</td><td>5,740,000</td><td>7,919,080</td></tr></table> <p>* Rs. 4053/- per credit hour and 18 credit hours per semester (Total 135 credit hours) * For first semester: Rs. 21000 (Admission fee), Rs. 5000 (Miscellaneous) and Rs. 10000 (Security Deposit - Refundable) shall be applicable. * Increase of fee is not considered while compiling data</p>		Student			Fee Per Student		Total Fee			Semester	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total	Spring 2023	15	-	15	108,954	-	1,634,310	-	1,634,310	Fall 2023	15	15	30	108,954	82,000	1,634,310	1,230,000	2,864,310	Spring 2024	-	30	30	-	82,000	-	2,460,000	2,460,000	Fall 2024	20	30	50	108,954	82,000	2,179,080	2,460,000	4,639,080	Spring 2025	-	50	50	-	82,000	-	4,100,000	4,100,000	Fall 2025	20	50	70	108,954	82,000	2,179,080	4,100,000	6,279,080	Spring 2026	-	70	70	-	82,000	-	5,740,000	5,740,000	Fall 2026	20	70	90	108,954	82,000	2,179,080	5,740,000	7,919,080
	Student			Fee Per Student		Total Fee																																																																																					
Semester	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total																																																																																			
Spring 2023	15	-	15	108,954	-	1,634,310	-	1,634,310																																																																																			
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Fall 2026	20	70	90	108,954	82,000	2,179,080	5,740,000	7,919,080																																																																																			
4	Expected Number of students for 1st & 2nd Intakes: 30 students																																																																																										

5

Expected Earning from first Intakes (B5): Rs. 4,498,620/-

	Student			Fee Per Student		Total Fee		
Semester	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total
Spring 2023	15	-	15	108,954	-	1,634,310	-	1,634,310
Fall 2023	15	15	30	108,954	82,000	1,634,310	1,230,000	2,864,310
							Total	4,498,620

6

Expected Earnings for the Next Three Years (B6): Rs. 31,137,240

	Student			Fee Per Student		Total Fee		
Semester	Fresh	Existing	Total	Fresh	Existing	Fresh	Existing	Total
Spring 2024	-	30	30	-	82,000	-	2,460,000	2,460,000
Fall 2024	20	30	50	108,954	82,000	2,179,080	2,460,000	4,639,080
Spring 2025	-	50	50	-	82,000	-	4,100,000	4,100,000
Fall 2025	20	50	70	108,954	82,000	2,179,080	4,100,000	6,279,080
Spring 2026	-	70	70	-	82,000	-	5,740,000	5,740,000
Fall 2026	20	70	90	108,954	82,000	2,179,080	5,740,000	7,919,080
							Total	31,137,240

7

Total Estimated Salaries of all Additional Human Resources (B7): Rs. 3,091,200/-

	New PFM (Qualification)	Per Semester Salary		Core Courses		VFM
Semester	MS	New PFM	Lab Assistant	PFM Load	Visiting courses	3 Credit Hour course
Spring 2023	-	-	-	-	1	86,400
Fall 2023	-	-	-	-	1	86,400
Spring 2024	-	-	-	-	2	172,800
Fall 2024	-	-	-	-	3	259,200
Spring 2025	1	420,000	-	4	1	86,400
Fall 2025	-	420,000	40,000	4	-	-
Spring 2026	-	420,000	240,000	4	-	-
Fall 2026	-	420,000	240,000	4	-	-
Total	1	1,680,000	20,000	16	8	691,200
					Total	3,091,200

- Employ a New PFM following the fourth semester to lighten the workload of current faculty. Monthly pay of newly hired PFM is 70,000/- per month
- After the fifth semester, hire a lab assistant to help students with their lab work. Monthly pay of Lab assistant is 40,000/- per month
- Need VFM to divide the workload of 08 courses. Visiting rate Rs. 1800/- per hour

8

Cost of Additional Laboratory Equipment/Tools (B8): N/A

9	Cost of Additional Classrooms (B9): N/A
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): Year 1: Rs. 100,000/-
11	Off-Site rental Expenses and Cost of other Fixtures (B11): N/A
12	Miscellaneous Expenses required for Starting the Program (Spring – Fall 2023) (B12): Visiting Courses Payment: Rs. 172,800/- Advertisement: Rs. 2*100,000= 200,000/- Printing & Stationery: Rs. 2*50,000= 100,000/- Admin Cost: Nil Outreach visit: Rs. 2*50,000= 100,000/- Total: Rs. 572,800/-
13	Total Expenditures for four years (B13): Salaries: Rs. 3,091,200/- Rentals: Nil Subscriptions/Memberships: Nil Advertisements (5 intakes): Rs. 5* 100,000= 500,000/- Printing & Stationery: Rs. 5*50,000=250,000 Admin Cost: Nil Outreach visit: Rs. 5*50,000=250,000 Total: Rs. 4,091,200/-
14	Total Cost of the Programme (B15): [Add B(11) and B(14)] Rs. 4,191,200/-
15	Total first year cost of the Programme (B16): [Add B(11) and B(13)] Rs. 672,800/-
16	Net Earnings in First Year (B17): [Subtract B(16) from B(5)] Rs. 3,825,820 /-
17	Net Earnings in four Years (B18): [Subtract B(17) from B(3)] Rs. 31,444,660/-

DEAN ES PROPOSAL FOR ADOPTION OF HEC UGE POLICY 2020 REQUIREMENTS

1. **Introduction of Practical Learning Lab (PLL).** 4-hours per week PLL will be implemented for every student as per policy. The breakdown of implementation will be as under:

Semester	Activity	Duration
2 nd	Sports activities within campus	Allocation of 2+2 hours (per week) in timetable respectively
4 th	Sports activities + Youth Club activities	Allocation of 2+2 hours (per week) in timetable respectively
6 th	CSP + Sports activities	Allocation of 40+ 24 hours in timetable respectively
8 th	Youth Club activities + Entrepreneurship training	Allocation of 1+3 hours (per week) in timetable respectively

2. **Mandatory 9-weeks Internship for all UG Programmes**
- Internships are offered to BU students after their 6th semester and are handled by Placement Coordinator of the department in coordination with DSA/ Manager SSC (CUs), who will arrange the mandatory internships.
 - The department can arrange 9-weeks Internship program for the students using its industrial linkages.
 - The internships may be offered in summer breaks.
3. **Establishment of Academic Advisement System at all CUs.** Academic Advisement already exists at BU. Following four types of advisements are in place and recommended to be maintained so:
- Advisory related to Roadmap of a Programme.** Advisor Students Affairs (ASA) are appointed in every department. These ASA provide necessary guidance to the students regarding course registration, options to select, drop and withdraw from courses, repeat courses and utilize summer semesters.
 - Mentorship.** Mentorship is practiced in the department where a PFM is appointed as Mentor for a group of students, who remains with the same class till its graduation. Mentors are responsible for the grooming of students on religious, moral and ethical values. A monthly report on mentorship is submitted by the department to Manager LDC.
 - Tutorial Session.** This mechanism is practiced to address course related difficulties of weak students. Such sessions are arranged on the request of the student.
 - Psychological/ Stress related Advisory.** Wellbeing Center administered by the Department of Professional Psychology provides assistance to those students who face psychological/ stress related problems/ issues.

DEAN MS PROPOSAL FOR PHD FOUNDATION RESEARCH CERTIFICATION COURSE

Preface. The prime research focus of Bahria Business School is to bring academic and research excellence in its academic programs and cultivation of research impact towards social, economic and financial development of Country. Currently, BBSI has more than 45 PhD Faculty; whereas the quality of research is lacking to cultivate the pertinence and impact of research towards social, economic and financial sector. In this purview to improve research quality and inclusion of strong research orientation among PhD Candidates, it is proposed that PhD Foundation Research Certification be introduced for new candidates interested in PhD Degree.

Scope

The objective of the PhD Foundation Research Certification is to inculcate research acumen in students as well as enhancing the rigor and quality of the research output produced by PhD students at BBSI. This foundation research dissertation will improve the quality of the PhD programs, increase the student intake as well as ensure the research optimization of PhD faculty at BBSI, thus bring academic and research excellence in its postgraduate PhD programs.

This zero semester/ PhD Foundation Dissertation based on (06 CH dissertation at MS-Level) shall be a non-commercial, entirely research based, and solely offered to those potential PhD Candidates those have been rigorously assessed by Interview Expert Panel.

This research certification shall be offered to PhD candidates of PhD programs offered at BBSI, who have cleared the PhD admission test, however, there is a lack of research orientation as assessed during the admission interview by the panel of expert PhD faculty at BBSI. The modalities of this certification are as follows:

- a. **Certification Objective**
 - i. To develop research acumen and improve research rigor of research students.
 - ii. To understand the process and aspects of PhD research and its significance.
- b. **Certification Learning Outcome**
 - i. To enhance scientific research orientation and robustness in line with quality of research.
 - ii. To demonstrate rigorous research ability pertinent with academic and industry relevance.

Credit Hours

PhD Foundation Certification shall be offered as a zero semester (Six Months) prior to enrollment in PhD program comprising of 06 credit hours' dissertation at MS-Level.

Structure and Certification Timelines

This is purely a research-based dissertation where the enrolled candidate will engage in developing a research dissertation with his/her supervisor. Therefore, there is no specific course/ course content for the subject certification. This certification shall be a 6 CH, offered prior to enrolment in PhD degree and thus not impacting the actual duration of PhD program. The financial effect is as follows:

Particular	Fee
Admission	Nil
Security	Nil
Registration/ 6 CH Fee	As per BU rules of MS Dissertation
Supervisor Honorarium 6 CH	As per BU rules of MS Dissertation

Since this is a research certification offered prior to initiation of PhD degree/enrolment of student in PhD Degree program hence it will not be reflected on PhD degree transcript. The enrolled students will get certificates and qualifying for PhD Admission based on Examiners' Assessment (Internal/External) at the end of the dissertation.

This is a pure research-based certification, solely offered to prospective candidates of PhD (MS/ Economics) programs at BBSI with the focus to improve the quality of the PhD program as well as ensure the optimization of PhD faculty at BBSI, thus bring academic and research excellence in its postgraduate PhD programs.

The certification requires a timeline of engagement and submissions through the time period stipulated. The proposed timeline is as follows:

Activity Description		Time/ week
a	Submission of Topic and Proposal to Research Cell	2 nd week
b	Submission of Ch 1, 2, and 3 of the dissertation to supervisor	8 th week
c	Submission of Ch 4 and 5 of the dissertation to supervisor	13 th week
d	Submission of completed document to Research Cell	15 th week
e	Presentation and Panel Viva	16 th Week

Completion of Zero Semester

- The candidates will be required to complete PhD Foundation Dissertation with quality of research duly assessed by External and Internal PhD Examiners.
- Enrollment in respective PhD Program is conditional to the satisfactory assessment of the candidate at the end of the semester. The zero semester must be completed before the commencement of full degree program.
- Maximum time period to complete the research dissertation is one year.

Assessment

- The research dissertation shall be presented by each candidate in a symposium conducted by BBSI and duly assessed by PhD Examiners (Internal and External)
- Panel of expert PhD faculty shall assess the research work/ dissertation of the student for onward enrollment in the full PhD degree program
- Panel of experts is to be decided by respective department at BBSI with subsequent approval of Dean MS.

Grant of PhD Admission based on PhD Foundation Research Certification

- Each candidate who fulfills the assessment criteria of PhD Foundation Research Certification shall be granted admission in PhD program at BBSI.
- Candidates who fail to qualify for admission in PhD or decide to discontinue the study but have completed the Foundation Dissertation with requisite criteria may be given 06 CH certification for completing Foundation PhD Research Certification.

NEW PROGRAMME PROPOSAL**Bachelor of Science in Islamic Studies**

A. ACADEMIC DETAILS	
1	Faculty/Department: Department of Islamic Studies, Bahria Humanities & Social Sciences School Islamabad and Bahria Humanities & Social Sciences School Karachi (BUIC & BUKC)
2	Name of the Programme: Bachelor of Science (BS) in Islamic Studies
3	Objectives of the Programme: The program will help students to PO 1: Comprehend and increase their knowledge of Islam as a religion and a worldview PO 2: Identify and ascertain contemporary socioreligious challenges in the Muslim world and their possible explanations through plausible academic research PO 3: Develop and maintain an accommodative, inclusivity and healthy attitude towards intra and interreligious debates thereby exhibiting the true spirit of Islam in character and behavior
4	Outcomes of the Programme: PLO 1: Comprehending views of Quran and Sunnah in theory and practice PLO 2: Developing an unbiased yet an unapologetic viewpoint around the history of Islam as a civilization PLO 3: Understand, relate and accommodate people from other faiths in their social circle PLO 4: Construct a futuristic understanding of Islam in terms of Leadership PLO 5: Learn and effectively apply modern tools of research and critique to face and answer the challenges faced by Muslims in the contemporary world PLO 6: Become self-motivated enduring a strong sense of purpose PLO 7: Exhibit responsibility for preservation of nature in line with Islamic ethos relating to both spiritual and material progress PLO 08: Develop and maintain a permanent attitude of learning, exploring and investigating newer fields and concepts in Islamic studies and religious sciences
5	Rationale for the Programme: Among the most important contemporary academic debates on religion, Islamic studies is found to be the most popular and is hence, being taught in many high-ranking universities around the world. Given that Pakistan's state religion is Islam and provided its current socio-religious and political dynamics, it is necessary that a plausible discourse on Islam as academic discipline be developed from within Pakistani University platforms with an aim of encompassing Pakistan's socio- economic, cultural, historical and political role in the world at large. It is in this view that BS Islamic studies is being proposed as a 4-year degree program in BU.
6	Brief Description of the Programme: Over the course of four years, students will be provided with an in-depth understanding of the role of Qur'an and Hadith in almost all spheres of life including private and public-specific domains such as family, society, politics, economics, culture and civilization. Foundational courses such as Qur'anic Studies and Hadith Sciences as well as Arabic language will equip students to form original perceptions and view points stemming from the classical sources of Islam thereby honing their research and analytical skills. Moreover, promoting interfaith harmony through intra as well as interreligious debates is going to be achieved through courses on the study of religion, philosophy and mysticism which will eventually broaden their vista of understanding on religion and society.
7	Duration: 4 Years (8 Semesters)

8	Venue(s): On Site/Off Site/Both On & Off Site <i>(Tick one; if Off Site, give details)</i> Department of Islamic Studies, BH3S-IC Department of Islamic Studies, BH3S-KC																						
9	Programme Scheduling Format: Once a year																						
10	Proposed Date of Commencement: Fall- 2023																						
11	Mode of Study/Examination: Semester System																						
12	Additional Faculty Member(s) Required: <i>Indicate if there is a requirement for additional faculty members, fulltime/visiting, along with qualifications.</i> <table border="1" data-bbox="338 495 919 591"> <tr> <th>PFM's</th> <th>Qualification</th> </tr> <tr> <td>02</td> <td>MS Islamic Studies</td> </tr> </table>		PFM's	Qualification	02	MS Islamic Studies																	
PFM's	Qualification																						
02	MS Islamic Studies																						
13	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																						
14	Additional Classroom(s) Required: <i>(The requirement is to include the number of classrooms and their capacities.)</i> 01 Class Room to start with.																						
15	Additional Requirement for Laboratories: <i>(The requirement is to include the number of laboratories, their equipment and their capacities.)</i> Nil																						
16	Additional Requirement for Books, Subscriptions, Memberships to Online Research Sites/ Repositories: 0.5 million/annum																						
17	Minimum Entry Level: As per BU Policy																						
18	Admission Criteria: As per BU Policy and Shahdah Khassah 50% with BCCI (UG) Equivalency Certificate																						
19	Additional/Different Examination Requirement <i>(Indicate if there will be any examination requirement, additional to or different from the BU Academic Rules or Examination Policy in vogue)</i> : As per BU Policy																						
20	Number of Admissions Expected for First Intake: 20 Students																						
21	Number of Admissions Planned/Expected for Subsequent Intakes: <table border="1" data-bbox="288 1279 1230 1536"> <tr> <th>S. No</th> <th>Semester/Year</th> <th>Intake</th> </tr> <tr> <td>1</td> <td>Fall 2023</td> <td>20</td> </tr> <tr> <td>2</td> <td>Fall 2024</td> <td>25</td> </tr> <tr> <td>3</td> <td>Fall 2025</td> <td>30</td> </tr> <tr> <td>4</td> <td>Fall 2026</td> <td>35</td> </tr> <tr> <td>5</td> <td>Fall 2027</td> <td>40</td> </tr> <tr> <td colspan="2">Total</td> <td>150</td> </tr> </table>		S. No	Semester/Year	Intake	1	Fall 2023	20	2	Fall 2024	25	3	Fall 2025	30	4	Fall 2026	35	5	Fall 2027	40	Total		150
S. No	Semester/Year	Intake																					
1	Fall 2023	20																					
2	Fall 2024	25																					
3	Fall 2025	30																					
4	Fall 2026	35																					
5	Fall 2027	40																					
Total		150																					
22	Referred by <i>(delete which is inapplicable)</i> : FBOS																						
22	Complete Plan of Studies, inclusive of complete Roadmap <i>(Attach as Annex 'A')</i> : Attached																						
23	Course Outlines, Descriptions, Pre-Requisites & Readings (Compulsory & Recommended) <i>(Attach as Annex 'A')</i> : Attached																						

B. FINANCIAL DETAILS		
1	Source of Funding: BU Fully funded	
2	Degree Duration: 4 years	Total Number of Credit Hours: 132
	Annual or Semester System: Semester (Minimum 8 semesters)	
3	Expected fee to be charged based on Cost & Benefits Analysis: <i>(show working)</i>	
	Year 1: 1000,000	Total 5 years earnings: 1,37,40000

4	Expected Number of students for 1st & 2nd Intakes: 20 + 25 = 45
5	Expected Earning from first two Intakes (B5): (<i>Show working</i>) 50,000 x 20 (1 st intake) + 50,000 x 25 (2 nd intake) = 1 Million + 1.25 Million = 2.25 Million
6	Expected Earnings for the Next Five Years (B6): (<i>show working</i>) One semester earning: 20 x 50,000= 1000,000 Five years earning= 1,37,40000
7	Total Estimated Salaries of all Additional Human Resources per annum (B7): Nil
8	Cost of Additional Laboratory Equipment/Tools (B8): (<i>show working</i>) Nil
9	Cost of Additional Classrooms (B9): (<i>Include furniture, technical aids etc.</i>) Nil
10	Cost of Additional Books, Subscription & Memberships to on-line Sites/Repositories (B10): (<i>show details</i>) 0.5 million/annum
11	Off-Site rental Expenses and Cost of other Fixtures (B11): (<i>Show details</i>) Nil
12	Miscellaneous Expenses required for Starting the Program (B12): Advertisement: Printing & Stationery: - Admin Cost: - Any other Total: 0.5 million
13	Annual Recurring Expenditures in Subsequent Years (B13): - Salaries: - Subscriptions/Memberships: - Advertisements: - Printing & Stationery: - Admin Cost - Any other - Total: 1 million
14	Total Cost of the Programme (B14): B(12) = 0.5 Million
15	Net Cost of the Programme (B15): [Subtract B(1) from B(14)] B(14) – B(1) = 0.5 Million - 0 = 0.5 Million
16	Net Earnings in First Year (B16): [Subtract B(15) from B(5)] B(5) – B(15) = 2.25 Million – 0.5 million = 15.25 Million
17	Projected Annual Gross Earning in Subsequent Years (B 17): (<i>show details & working; add 10% towards all expenses in subsequent years.</i>) 1 million (incremental) (10 % of 1 million every year)
18	Projected Annual Net Earning in Subsequent Years: [<i>Subtract B(13) from B(17)</i>] B(17) – B(13) = 1.7 million – 1 million = 0.7 Million

COURSE OUTLINE

Course Name	Critical Thinking	Prepared on	Spring 2022
Course Code			
Credit Hours	3		
Course Prerequisite			
Prerequisite Code		Revised on	June 23 2022
Course Type	Core Course		
Program	Bachelor of Social Sciences (BSS)		
Semester	Spring 2022		
Course Description			
<p>This course studies a process which is indispensable to all educated persons- the process by which we develop and support our beliefs and evaluate the strength of arguments made by others in real life situations. It includes practice in inductive and deductive reasoning, presentations of arguments in oral and written form, and analysis of the use of language to influence thought. The course also applies the reasoning process to other fields such as business, science, law, social science, ethics and the arts, thus improving the thinking skills of students to succeed in the world.</p> <p>There is a weekly reading schedule for this course which is delineated in the course outline. These readings comprise the mandatory reader for this course. The mandatory reader is available at the photocopy center of the university. Every student must get him/herself a copy of this reader. Every student is expected to do the readings prescribed for each week before that weekend. There will be 4 surprise quizzes spread over the whole semester. These quizzes will be based on lectures and scheduled readings up to that point in the course. There will be home/class assignments also. There will be one midterm and one final term exam as per the university examination schedule. Class participation will also carry marks.</p> <p>Program Objectives (POs)</p> <p>PO 1: To prepare graduates acquire deep understanding and knowledge of International Relations, Development Studies, Anthropology and Sociology as well as the ability to analyze any given situation.</p> <p>PO 2: To prepare students with sound academic foundation that helps them to question critically, think logically, communicate clearly, act resourcefully, and live ethically.</p> <p>PO 3: To inculcate an understanding of essential concepts and theories of related disciplines enabling the students to draw evidence-based conclusions.</p> <p>PO 4: Impart diverse skills to our graduates to work at the leading national and international organizations, think tanks, and government offices for implementing result-oriented policy solutions.</p> <p>PO 5: To prepare students to apply theoretical knowledge to identify lacunae in the policy implementation and suggest cutting-edge solutions to improve socio-economic indicators in the country.</p> <p>Program Learning Outcomes (PLOs) : After completion of the degree, students will be able to</p> <p>PLO 1: Demonstrate intellectual and analytical skills in the realm of IR, DS, Anthropology and Sociology.</p> <p>PLO 2: Apply the gained knowledge and acquired skills into various practical domains.</p> <p>PLO 3: Conduct high impact research on the diverse global, regional and national social, political, cultural and economic development.</p> <p>PLO 4: Plan and execute result-oriented strategies to address the most pressing contemporary socio economic and political challenges.</p> <p>PLO 5: Students are able to monitor and evaluate existing policy interventions.</p>			

COURSE LEARNING OUTCOMES (CLOs)

S. No	Upon the completion of the course the students would be able:	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	Demonstrate an increased ability to explain an issue or problem comprehensively.	✓	✓	✓	✓	✓
CLO2	Establish an enhanced ability to employ evidence/information in conducting a comprehensive analysis of an issue or problem.	✓	✓	✓	✓	✓
CLO3	Apply an enhanced ability to analyze contexts when presenting a position on an issue or problem	✓	✓	✓	✓	✓
CLO4	recognize an enhanced ability to describe he/her perspectives along with those of others associated with the situation.	✓	✓	✓	✓	✓
CLO5	Formulate an enhanced ability to formulate a thesis/hypothesis that takes into account the complexity of an issue or problem	✓	✓	✓	✓	✓
CLO6	Develop an enhanced ability to draw logical conclusions and implications from the analysis of an issue or problem.	✓	✓	✓	✓	✓

Teaching & Learning Methodology

Teaching and learning approaches should foster a sense of understanding and respect, and sensitize students with emotions and feelings of tolerance towards others. Critical Thinking help students develop the habits of assessing and defending the reasonableness of our beliefs and values and those of others.

Students are also engaged in project work, group discussions on articles from the newspapers and magazines that depict moral issues and problems. Attempt is also made to help students identify, evaluate and construct inductive and deductive arguments in spoken and written forms. Recognize common fallacies in every day reasoning Distinguish the kinds and purposes of definitions. Distinguish the functions of language and its capacity to express and influence meaning and Recognize and assess arguments in various forms of reasoning.

Text Book and References

Text Book: Skills for Success, Personal Development and Employability by Dr.Stella Cottrell.

Reference Books: Critical Thinking for students, Learn the Skills of Critical Skills and Effective Argument by Royvan- Den

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	Learning Objectives Addressed
1.	Topic: What is Critical Thinking <ul style="list-style-type: none"> • Why develop critical thinking skills • Benefits and Pitfalls of non-critical thinking 	Upon completion the students will have an idea of what is involved in improving critical thinking skills. Activity: Watching introductory videos to give an idea of what is involved in critical thinking.	CLO 1,3
2	Topic: Why develop Critical Thinking skills <ul style="list-style-type: none"> • Reasoning • Ancillary skills • Underlying skills and development • Self-awareness for accurate judgement. • Personal strategies for CT 	Upon completion the students will get an idea about the benefits of CT skills. They will also be able to understand ancillary skills and attitudes required to improve it. Activity: An Assignment on identifying their influences.	CLO 1,3,4,6
3	Topic: Critical thinking barriers	Through this topic student will be able to understand the various barriers creating hurdles in our thinking. Activity: On completion the students will do a video project on CT barriers.	CLO 2,3
4	Topic: Developing Thinking Skills <ul style="list-style-type: none"> • Assessing thinking skills • Detecting Emotional Manipulation • Focusing Attention • Identifying Difference • Recognizing Sequence • Categorizing 	On completion students will get some practice on improving their ancillary skills to become sharp and alert in different situations. Activity: Exercises in class to develop ancillary skills.	CLO 4
5	Topic: Identifying/ Recognizing/ Evaluating Arguments <ul style="list-style-type: none"> • Author's Position • Persuasion through reason • Pinpointing Issues 	Upon completion, the students will demonstrate an enhanced ability to analyse contexts when presenting a position on an issue or problem Activity: A quiz. Presentation on identifying the structure of an argument.	CLO 2,3,4
6	Activity in class Presenting and defending an argument	On completion the students will have learnt the skill of presenting and defending argument. Activity: The focus of the activity is on persuasive reasoning.	CLO 4,6

7	Topic: Arguments/Non-Arguments <ul style="list-style-type: none"> Arguments and Disagreements Description Explanation Distinguishing Arguments from other Material 	<p>On completion the students will know the difference between arguments and non-arguments. How description, explanation summary is confused with the structure of an argument.</p> <p>Activity: Identifying the type of non-Argument from the given choices.</p>	CLO 3,4,6
8	Topic: Step by Step Analysis of Arguments <ul style="list-style-type: none"> Pinpointing Issues Identifying Arguments Seeking Clarity Understanding Context Finding Credibility Looking for Consistency Judging Arguments Assignment for HW 	<p>Upon completion, the students will demonstrate the skill of structure analysis of a given passage.</p> <p>Activity: Quiz presentation on identifying clarity, consistency and credibility in reasoning.</p>	CLO 3,6
9	MID-TERM EXAMS		
10	Topic: Implicit arguments <ul style="list-style-type: none"> Identify Assumptions Identifying hidden Assumptions Implicit assumptions used as reasons 	<p>Upon completion the students will demonstrate their ability to understand underlying assumptions in the given argument.</p> <p>Activity: Home Assignment on identifying hidden assumptions in newspaper articles.</p>	CLO 3
11	Topic: Implicit Arguments <ul style="list-style-type: none"> False premises. Why use implicit arguments Denoted and connoted meanings Stereotyping/ Latent messages. 	<p>On completion the students will demonstrate their ability to understand the benefits of using implicit argument.</p> <p>Activity: Exercises on Identifying Implicit arguments and ideological assumptions.</p>	CLO 3,4
12	Topic: Flaws in the arguments <ul style="list-style-type: none"> Assuming Casual Link Correlations and false correlations 	<p>Upon completion the students will demonstrate their ability to understand the flaws in the argument.</p> <p>Activity: Exercise on identifying correlations and false correlation in argument.</p>	CLO 3,4
13	Topic: Not meeting the necessary conditions	<p>Upon completion the students will demonstrate their ability to understand the requisites of formulating a solid</p>	CLO 3

	<ul style="list-style-type: none"> • Not meeting sufficient conditions • False Analogies • Deflective language 	<p>case for argument and the tactics people use to deceive others.</p> <p>Activity: An exercise on Necessary and sufficient conditions.</p>	
14	Topic: Recognizing Deceptive Reasoning	<p>Upon completion the students will demonstrate their skills to identify the deceptive reasoning tactics which distort the reasoning process.</p> <p>Activity: A presentation in class to identify deceptive tactics.</p>	CLO 3,4
15	Topic: Styles of Critical Thinkers and Non-Critical Thinkers.	Upon completion the students will be able assess their own self and see if they are more towards Critical thinking style or non-critical thinking style.	CLO 3
16	Topic: Revision	Problem solving	CLO 1,2,3,4,5,6,7
	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, presentations by student groups and case studies.

COURSE OUTLINE

Course Name	Pakistan and Geo-Political Studies	Prepared on	Summer 2022
Course Code			
Credit Hours	3		
Course Prerequisite			
Prerequisite Code		Revised on	As per Requirement
Course Type	Elective		
Program	Bachelor of Business Administration (BBA)		
Semester	Fall 2022		
Course Description			
This course will elaborate the students about geopolitical significance of Pakistan, which has played important role in dynamic international relations since Cold War. Pakistan’s geographical position and resources has provided it with advantageous capability to exert its influence at the regional and global political arena. Pakistan being surrounded by three major powers of the world, China, India and Russian Federation, played a significant role in Cold War and War on terrorism. Pakistan’s geopolitical role is an important factor in the stability of South and Central Asia. This course will make the students aware about Pakistan’s historical geopolitical role in world politics by discussing trade agreements, wars and treaties in the regional and global context and their implications on socio political dynamics of Pakistani society. This course will also enable students about future prospects of geopolitical significance of Pakistan and its utilization for the economic development of Pakistan by discussing new geopolitical arenas like BRI, CPEC, SCO, Eurasian and Central Asian and Indo Pacific Issues. As geographical and geostrategic importance of Pakistan is obvious, multirole and will increase on the global horizon in forthcoming years.			
Course Learning Outcomes			
CLO No.	Description		
1.	Upon successful completion of the course, the students will be able to: <ul style="list-style-type: none">Comprehend the intricate linkage that international politics has to the geographical factors.		
2.	Critically examine the geo-political significance of Pakistan.		
3.	Understanding regional and global issues affecting the peace, development and security of Pakistan.		
4.	Rationalize and propose the best possible options for tapping the full potential of geographical factors to achieve the political and economic advantage		
Teaching & Learning Methodology			
Following tools would be utilized during semester to develop the understanding of the core concepts of geo-politics and Pakistan geo-political positioning. <ul style="list-style-type: none">Review of the articleSeminar Activity – Students will prepare a talk on a given topic related to the subject.QuizzesResearch EssayResearch Presentation			
Text Book and References			
Text Book: <ul style="list-style-type: none">Asia, America, and the Transformation of Geopolitics by William H. Overhalt			

- Introduction to Geo-politics by Colin Flint
- Pakistan at the Crossroads: Domestic Dynamics and External Pressures by Christopher Jaffrelot

Reference Books:

- The China-Pakistan Axis: Asia's New Geopolitics by Andrew Small
- Geopolitics of the World System by Saul Bernard Cohen
- The Geopolitics of South Asia: From Early Empires to India, Pakistan and Bangladesh by Graham P. Chapman
- Geo-politics of the Pakistan-Afghanistan Borderland by Syed Sami Raza
- Pakistan and Geo-strategic Environment by H. Rizvi

Grading Policy

	Assessment Instruments	Percentage
	Quizzes	15%
	Assignments	20%
	Mid Term Exam	25%
	Final Exam	40%

Week-wise Course Outline

Week	Contents	Activities & Learning Outcomes
1.	Introduction to Geo-politics Understanding geo-politics Geo-politics, power and geography	<ul style="list-style-type: none"> - Power point lecture - Discussion on basic concept of geo-politics - Asia, America, and the Transformation of Geopolitics by William H. Overhalt - Introduction to Geo-politics by Colin Flint - Geopolitics of the World System by Saul Bernard Cohen
2	Historical Analysis of Pakistan's Geopolitical significance and World Politics	<ul style="list-style-type: none"> - The Geopolitics of South Asia: From Early Empires to India, Pakistan and Bangladesh by Graham P. Chapman - Modelski Model of World Leadership - Contemporary Geo-political Environment of the World
3	Regional Geo-political Structure and Role of Pakistan	<ul style="list-style-type: none"> - Pakistan's geo-political Significance - Geo-political Factors influencing Pakistan's foreign Affairs - Pakistan at the Crossroads: Domestic Dynamics and External Pressures by Christopher Jaffrelot
4	Geo-Political significance of Pakistan and changing world order	<ul style="list-style-type: none"> - Cooperation - Conflict - The China-Pakistan Axis: Asia's New Geopolitics by Andrew Small
5	Afghanistan and Kashmir issue and geopolitics of Pakistan	<ul style="list-style-type: none"> - Boundary - Map of Pakistan
6	Afghanistan and Kashmir issue and geopolitics of Pakistan Continued	<ul style="list-style-type: none"> - Embedding Geo-politics with border issues
7	Geo-political Meta-geographies <ul style="list-style-type: none"> - Terrorist Networks & Global War on Terrorism and role of Pakistan 	<ul style="list-style-type: none"> - Meta-geography – Geopolitical Globalization - Pakistan and the Global War on Terrorism

8	Pakistan's Bilateral Relations	- Pakistan's foreign policy with India, Afghanistan, China, Bangladesh, Bhutan and Iran
MID TERM		
9	Political Economy of Pakistan - Trade Agreements of Pakistan	- How Geo-political positioning has provided it with an advantage to sign trade agreements - CPEC
11	Regionalism and Regional Integration SCO and Pakistan	- Problems & Prospects
12	Pakistan Relations with US & China	- Role of Extra regional powers
13	Pakistan's Relations with Central Asia	- Significance of Central Asia for Pakistan
14	The Nuclear Issue: Current Developments & Future	- Dynamics of power - Security competition
15	Politics of Extremism in South Asia: Options for Pakistan	- Pakistan's efforts and policies
16	Completion of Syllabus Revision	
17	Revision and Quiz over whole syllabus after Mid Term	
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.

CURRICULUM & COURSE OUTLINE

Campus	: Bahria University Health Sciences Campus Karachi
Department	: Medical Education
Program Title	: Certificate in Health Profession Education
Total Duration of Program	: 06 Months
Total Credit Hours	: 12
Pre-requisite Qualification	: MBBS, BDS, DPT, BSN & Allied Health
Total Number of Semesters	: Not Applicable
Course Code	: Not Applicable
Course Title	: Not Applicable

COURSE OBJECTIVES:

Adult Learning and curriculum

- Identify different types of learners
- Discuss different theories and beliefs, about how students learn
- Differentiate between discipline-based, organ-based, problem-based, competency-based, and evidence-based curricular models, to apply the dynamics of each model in appropriate settings.
- Differentiate between goals, objectives & outcomes for curriculum planning.
- Learn how to write course objectives
- Differentiate between different types & levels of objectives
- Organize and write-up a module/block plan for a program.

Teaching and Learning and Leadership

- Design and deliver teaching/learning sessions, selecting from a range of teaching methods as appropriate to specific learning outcomes e.g. knowledge, conceptual understanding, clinical and diagnostic skills, professional values and behavior.
- Differentiate between common approaches used for small and large group teaching
- Discuss the strengths and limitations of different modes of instructions
- Identify, develop and use effectively appropriate learning resources to support student learning including a range of technology-based resources.
- Critically review literature relevant to different teaching methods
- Identify the relevance of such issues to his/her own professional context
- Propose feasible strategies relevant to own professional context
- Demonstrate an understanding of the role of feedback in student learning and identify appropriate feedback strategies.
- Reflect on digital teaching and learning practices
- Integrate different digital teaching strategies in medical education
- Discuss active and student centered learning strategies in medical education
- Identify the basic principles underlying PBL and CBL.
- Differentiate between PBL and CBL process
- Construct an integrated clinical scenario based on the principles of PBL and CBL construction
- Introduction to leadership styles
- Identify different leadership styles and relate them to your own professional context
- Recognize the role and traits of educational leadership.

Assessment Research & Evaluation

- Distinguish different types of competency-based assessment (formative, summative, norm-referenced and criterion-referenced) with their application in medical education
- Describe competence based assessment system in terms of validity, reliability, educational impact, acceptability and cost
- Identify different methods or tools used for assessment of all three domains (knowledge, skills and attitudes) in terms of learning outcomes
- Recognize the differences between the types of validity and reliability in assessment
- Identify item analysis including: item difficulty index, item discrimination index and item distractors with its application in assessment
- Construct MCQs (Multiple Choice Questions), SAQs (Short Answer Questions) and EMQs (Extended Matching Questions)
- Develop TOS (Table of Specification) according to the participant's discipline and subject
- Differentiate between different types of curricular blueprints in relation to assessment
- Group presentations of TOS
- Group Presentations of MCQs, SAQs and EMQs
- Identify and select relevant and feasible research questions and problems.
- Identify a range of research methods, recognizing their strengths, weaknesses and appropriate applications.
- Access and critically review literature relevant to research question or problem.
- Carry out data collection and analysis using at least two different methods.
- Develop a research proposal for a small piece of educational research, selecting and justifying data sources (primary and secondary), methods to be used and potential ethical issues and concerns raised. Identify a range of current issues in medical education in a local, national and international context.

Objective of Assignments During Distant Learning**Part – I**

- Design a 6 week long module in discipline of your choice.
- Decide its placement in the curriculum.
- Write down the goals and objectives for the whole module.
- Specify the domain of each objective

Part – II

- Relate the objectives designed in the assignment part I to their respective teaching and learning strategy
- Justify your choice with the benefits of the choice
- Reference research articles for your desired choice

Part – III

- Design complete curriculum for a six week module combining assignment part I & II containing the following
 - Problem statement and context
 - Needs Assessment
 - Goals & Objectives
 - Educational Strategies
 - Implementation
 - Assessment methods
 - Concept map

- Relate the objectives and teaching strategies with assessment tools
- Suggest measures to incorporate similar changes in your curriculum
- Write down a research proposal for health profession education

Course Learning Outcomes:

To prepare health professional educators who are able to:

- Apply educational principles to design curriculum and learning objectives
- Identify different types of learners and use teaching and learning strategies according to them
- Design effective teaching sessions and skills to conduct them
- Develop quality assessments items according to the domains of learning and can avoid item writing flaws
- Develop an understanding of educational leadership and research basics

Course Contents:

1. Development of curriculum
2. Teaching and learning
3. Leadership
4. Assessment
5. Research
6. Evaluation

Course Layout

Session 1 (FTF)	1 week	7 th November to 11 th November 2022	Adult Learning & Curriculum
Distance learning and assignment Part I			
Session 2 (FTF)	2 weeks	January 2023	Teaching and learning & leadership
Distance learning and assignment Part II			
Session 3 (FTF)	2 weeks	March 2023	Assessment, Research and Evaluation
End of Course-Final Assignment			
Course ends 7 th of May 2023			

Recommended Text Books/Reference Books (latest edition):

- Ronald M Harden., *A Practical Guide for Medical Teachers*. 5th Edition-Elsevier
- Peter Cantillon, Linda Hutchinson and Diana Wood, *ABC of Learning and Teaching in Medicine*, 2nd edition, BMJ books, ISBN 07279 16785
- Kern, E. David and Others. *Curriculum Development for Medical Education: A Six-Step Approach*. The John Hopkins University Press. 2nd Edition
- Strainer DL, Norman GR, Cairney J. *Health measurement scales: a practical guide to their development and use*. Oxford University Press, USA; 2015.

Web Resources/Other Course Materials

- Best Evidence Medical and Health Professional Education (BEME Collaboration)
- Health Education Assets Library (HEAL)
- MedEdPORTAL
- AMEE.org
- <https://pubmed.ncbi.nlm.nih.gov>

Prepared by: Prof. Dr. Talea Hoor

JD-DME

BUHSC-K

**MISSION STATEMENT, OBJECTIVES, GOALS AND SCOPE OF BUHSC-PGI
AND PHD/ MPHIL PROGRAMMES OF BUHSC**

Mission Statement of BUHS-PGI

To attain highest standards in knowledge and creativity driven health professional skills of learning, teaching and transformative research involving national and International and linkages for prevention, diagnosis, treatment of human illnesses and community care.

Objectives of BUHS-PGI

1. To formulate and provide integrated strategies for replenishing the academia in the health professional's educational set up with key principles of knowledge and creativity in teaching, training and research framework supporting the long-term health professional needs of Pakistan.
2. To bring forward cost-effective preventive, diagnostic, treatment and care management solutions in health professional's fields aligned with the economic and financial dimensions of Pakistan.
3. To produce leaders of next generation in health professional's fields with critical thinking and self-reflection to participate in policy making in Health Sciences fields.
4. To improve health professional quality care standards in the country and region by establishing collaborative linkages with leading institutions nationally and internationally.

Goals of BUHS-PGI

1. To align the vision of Bahria University for health professional education in Pakistan.
2. To equip health professional students with the ability to understand basic principles of learning, teaching & research, application of evidence-based reference tool, behavioral and communication skills (verbal, written and body language), empathy, compassion and professionalism for provision of holistic applied and patient-centered approach.
3. To abreast health professional students with technological advances in medical and health sciences related fields, such as integration of information technology to connect healthcare facilities and institutions nationwide.
4. To formulate and advocate key principles of teaching, training and research framework standards for health professional education and policy making in Pakistan.
5. To provide strategies and steer the long-term development of health professional education in the country by bringing forward cost-effective, preventive, diagnostic, treatment and care management solutions aligned with the economic and financial dimension in the country.
6. To energize the health care delivery standard by replenishing the academia and researchers in health professional's educational set up.
7. To establish linkages with leading institutions nationally and internationally for collaboration on local, regional and global health issues.

CHANGES IN TOS BDS

RECOMMENDATIONS FOR UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Following Recommendations are proposed

- . Oral Biology and Tooth Morphology will be part of 1st Professional year not of 2nd Professional year. Tooth morphology will be given due weightage with the clinically relevant practice for example cavity preparation and root canal access.
- . Science of Dental Material will be part of 2nd Professional year not of 1st Professional year.
- . Preclinical Operative dentistry and Preclinical Prosthodontics will be part of the Science of Dental Materials Practical Examination in the second professional examination.
- . Oral Medicine, Diagnosis & basic principles of Oral Radiology may be taught as a single subject.
- . Preclinical training in community dentistry should be carried out in second year in skills lab, while in third year the community visit will consist of community-based clinical procedure.
- . Periodontology will be taught and assessed separately from Oral Medicine.
- . Pharmacology curriculum with regards to Analgesics, Antibiotics, and Local Anesthesia may be given higher TOS weightage.
- . An integrated approach for teaching of Implantology is to be adopted. Surgical component can be covered by certified implantologist who can be either Oral Surgery or Periodontology whereas implant restoration to be covered by Prosthodontics or Operative Dentistry. University or Examining body to decide in their curriculum about which faculty is to teach this.
- . Pediatric Dentistry and Endodontics should be taught and examined as a separate subject.
- . Research should be included as the integral part of curriculum and should be taught from simple to complex concepts as per respective University Curriculum
- . There should be Behavioral Sciences, Professionalism, Ethics, Patient safety, leadership & management, IT and communication skills curricula taught from simple to complex concepts
- . Elective Courses for undergraduate dental students should be encouraged.



BDS Second Professional year		
	Subjects	Suggested Total hours
1.	General Pathology	200
2.	Pharmacology	200
3.	Oral Pathology	200
4.	Science of Dental Materials	280
5.	Preclinical/clinical Operative	70
6.	Preclinical /clinical Prosthodontics &	70
7.	Preclinical /clinical Pediatric dentistry	20
8.	Behavioral Sciences including a. Professionalism b. Communication Skills c. Dental and dental Ethics	10
9.	Research	50
10.	Self Directed learning	100
	Total	1200

BDS Third Professional year		
	Subjects	Suggested Total hours
1.	Oral Medicine, Oral Diagnosis and Oral Radiology	150
2.	Periodontology	185
3.	Preventive & Community Dentistry (Research)	200
4.	General Surgery	150
5.	General Medicine	150
6.	Preclinical /clinical Prosthodontics	70
7.	Preclinical /clinical Operative Dentistry	70
8.	Preclinical /clinical Pediatric dentistry	30

CHANGES IN BDS CURRICULUM TABLE OF SPECIFICATIONS (TOS)

Oral Biology

1. Cytoskeleton, Cell Junctions, Fibroblast & ECM with TOS ID 28.2.12 should be added under TOS ID of Developmental Histology.
2. Occlusion of Primary and Permanent Dentition with TOS ID 28.4.4 and Forensic Dentistry with TOS ID 28.4.5 should be added under TOS ID of Tooth Morphology and Occlusion.
3. Facial Growth and Development with TOS ID 28.7 to be part of Oral Biology curriculum and TOS with 2 MCQs for assessment.
4. No. of MCQs for Topic:
 - a. Tooth Morphology and Occlusion should be reduced to 5 (current MCQs 9).
 - b. Deciduous Dentition and Permanent Dentition should be reduced to 8 (current MCQs).
5. No. of SEQs for topic:
 - a. Developmental Histology should be increased to 3 (current SEQs 2).
 - b. Tooth Morphology and Occlusion should be reduced to 1 (current SEQs 2).
 - c. Deciduous Dentition and Permanent Dentition should be reduced to 1 (current SEQs).

Department of Community & Preventive Dentistry

1. No. of MCQs for topics:
 - a. Oral Epidemiology should be increased to 11 (current MCQs 9).
 - b. Dental Health Care Delivery System should be decreased to 4 (current MCQs 5).
 - c. Behavioral Science should be increased to 5 (current MCQs 4).
 - d. Biostatistics should be reduced to 2 (current MCQs 4).
2. No. of SEQs for topics:
 - a. Oral Epidemiology should be decreased to 1 (current SEQs 2).
 - b. Prevention of Oral Disease & Health Promotion should be reduced to 2 (current SEQs 3).
 - c. Behavioral Science should be increased to 2 (current SEQs 0.5).
 - d. Biostatistics should be reduced to 1 (current SEQs 0.5).

Oral Medicine

Odontogenic Infection, Cellulitis, Ludwig's Angina with TOS ID 32.5.4 to be added under TOS ID of Oro-Facial Infection.

General Medicine

1. 30.1.2 Hyperthermia to be changed to Heat Disorders.
2. 30.2.7 Tachyarrhythmias to be changed to Rhythm Disorders
3. New topic Covid-19 with TOS ID 30.3.7 and Fungal infection with TOS ID 30.3.8 to be added in curriculum under TOS ID of Infectious Diseases.
4. 30.9.1 Nephrotic Syndrome and Proteinuria.
5. 30.9.5 Acute glomerulonephritis, Nephritic Syndrome and Hematuria .
6. No. SEQs for Infectious Diseases and Disease of the Skin should be reduced to 0 from 1.

Operative Dentistry

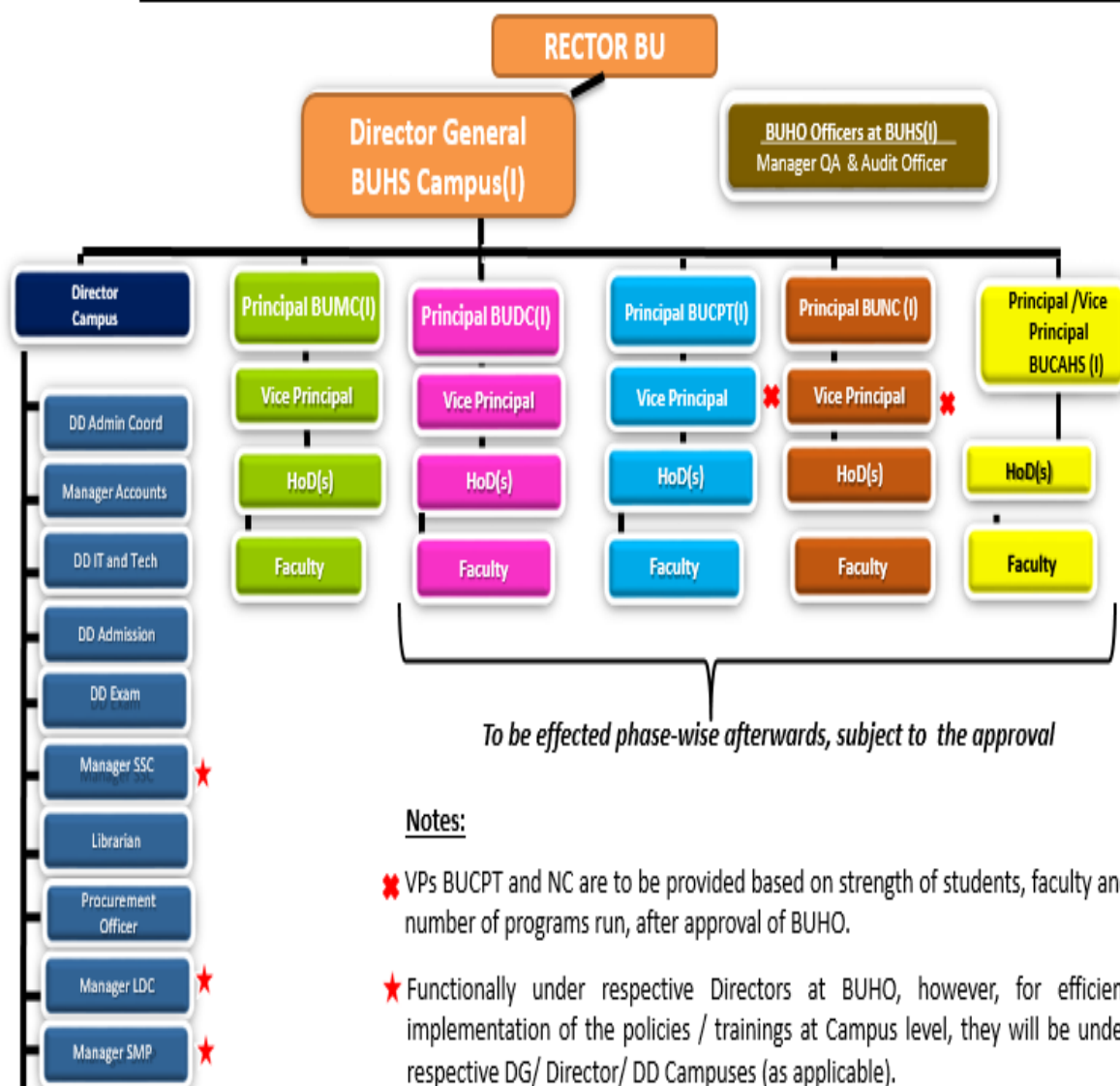
1. Periodontal Diseases with TOS ID 34.3.4 in Children to be added under TOS ID of Pedodontics with addition of 1 MCQ.
2. No. of MCQs for topics Dental Trauma, Resorption & Pulp Therapy in Primary and Young Permanent Teeth should be reduced to 4 (current MCQs 5).

Orthodontics

1. No. of MCQS for topics:
 - a. Growth & Development to be increased to 12 (current MCQs 10).
 - b. Diagnosis to be increased to 12 (current MCQs 7).
 - c. Biomechanics to be decreased to 5 (current MCQs 7).
 - d. Appliances to be decreased to 1 (current MCQs 6).
2. No. of SEQs for topics:
 - a. Growth & Development to be increased to 3 (current SEQs 2).
 - b. Diagnosis to be increased to 2 (current SEQs 1).
 - c. Biomechanics to be decreased to 1 (current SEQs 2).
 - d. Appliances to be decreased to 0 (current SEQs 1).

Prosthodontics

1. TOS ID 33.2 will be named as Treatment Planning instead of Impression Techniques.
2. TOS ID 33.4 will be named as Unconventional Dentures instead of Replacement denture.
3. No. of MCQS for topics:
 - a. Complete Denture to be decreased to 6 (current MCQs 10).
 - b. Treatment Planning to be increased to 6 (current MCQs 3).
 - c. Fixed Partial Dentures to be increased to 9 (current MCQs 7).
 - d. Maxillofacial Prosthodontics to be decreased to 1 (current MCQs 2).
4. No. of SEQs for topics:
 - a. Treatment Planning to be decreased to 0 (current SEQs 1).
 - b. Gerontology to be increased to 1 (current SEQs 0).

BAHRIA UNIVERSITY HEALTH SCIENCES CAMPUS ISLAMABAD - ORGANIZATION

SOP FOR OUTBOUND EXCHANGE STUDENTS FOR MACQUARIE UNIVERSITY, AUSTRALIA

1. Based on the maximum provision of students to be sent in an academic year, as permitted by Macquarie University, Australia, there shall be students selected from each campus of Bahria University including, Islamabad, Karachi & Lahore, to go on the exchange program to Macquarie University, Australia. The maximum number of students that can be recommended by any Campus would be based on the percentage of number of relevant students at that Campus. In case suitable candidate(s) are not available in a campus, the seat may be transferred to the other campus.
2. The recommendation of students is to be made by the following authorities:

<u>CAMPUSES</u>	<u>Nominating Authority</u>
BUIC	Director Admin BUIC (E-8)
BUKC	Director Admin BUKC
IPP	Director Professional Psychology
BULC	Director Campus Lahore

3. The above authorities will interview and shortlist students from their respective campuses based on following selection criteria, which should reflect the highest quality of students:
4. **Selection Criteria:**
 - a. The students must be a regular student of Bahria University taking full course load.
 - b. The minimum CGPA of the student should be 3.0.
 - c. The student must have studied for more than a year (2 semesters) with Bahria University. Students in 2nd semester will be eligible to apply.
 - d. The student must be proficient in English and have good communication skills.
 - e. The student must not have any disciplinary cases against them and should be void of any attitude problem.
5. The shortlisted students will be re-evaluated by a following member committee at Bahria University to shortlist students for final approval of Rector:

Pro-Rector (Academics)	-	Chairperson
Registrar	-	Member
Director Academics	-	Member
Director Admissions	-	Member
Director Examinations	-	Member
Director Students Affairs	-	Member
Director International Office	-	Member

6. The selected students must sign a written bond with Bahria University to return to Pakistan to continue their remaining studies with Bahria University or to complete remaining degree requirements.
7. The responsibility of tuition fee at Macquarie University and accommodation arrangement in Australia, during the course of stay, will be on student. The International office will assist the selected students in finding suitable accommodation. In addition to the expenses pertaining to tuition fee and accommodation, students will also be responsible for travelling & visa/pass expenses, medical/health insurance or any additional service charges they wish to avail or are required for travel to Australia for exchange programme.

8. The student will defer their semester prior going to Macquarie University, Australia, under the Exchange Programme. There shall be no tuition fee charged at Bahria University for this process. The decision on duration & number of semesters, to defer, is to be taken by the relevant Head of Department according to number of days the student will spend at Macquarie University, Australia, under exchange program. The student must adhere to departure and return dates as specified by his/her department.

9. The duration of the semester(s) studied abroad will not be counted towards the calculation of time bar.

10. **Eligibility for Honors & Awards.** Students availing the exchange programme at the Macquarie University, Australia, will be eligible for academic honors & awards, as long as they are taking full semester loads in their studies at Bahria University and finishing remaining degree requirement with their batch of registration.

11. If, as a result of the exchange activity, any of their courses are affected, these students would be permitted to make up for the shortfall (of the affected courses only) on return to Bahria University either during the summer sessions, if offered, or during succeeding regular semester, in excess to their regular course load.

12. If during the summer session:

- a. the students take shortfall courses, they will be awarded actual grades and no capping will apply.
- b. the students take any course, which were not affected by the exchange programme, summer session rules will apply and the students will become ineligible for Honors & Awards.

Transfer of Credits as a result of an Outbound Exchange Program

13. Student interested in registering for the courses at Macquarie University, Australia, for which they can avail **credits transfer** at Bahria University, shall be properly advised by the relevant Head of Department about the compatibility of the courses they wish to take, based on the course content, before departure.

14. The student must inform their Head of Department about the possible courses they wish to take at Macquarie University, Australia, along with the course outline. A preliminary meeting of the Equivalence Committee should take place, before the departure of student. The committee shall give clear instructions to the student, in writing, on a prescribed form (attached), on the course(s) he/she can take to avail **credits transfer**, against course(s) of similar nature, at Bahria University as per the road map of the program he/she is studying.

15. The final decision on **credits transfer** is to be taken, on return of the student, and successful completion of the courses, as per following criteria:

- a. Students applying for **credits transfer** are to submit original interim transcript and the course outlines of the course(s) studied at Macquarie University, Australia, to their relevant Head of Department (HOD) on return. The HOD will then formulate an Equivalence Committee to make final recommendations to their relevant Director of Institute. The Director will then forward recommendation of the Equivalence Committee to Director International Office for processing case for final approval. There shall be no fee charged from the student for **credits transfer**.

- b. **Credits transfer** of courses will only be allowed for Degree level programs (*equivalent to similar level program at Bahria University*) offered on campus.
- c. **Credits transfer** for only those courses will be allowed for which a course with at least similar standard, credit hours and matching description is available in the relevant academic program of Bahria University. As the marking criteria at Macquarie University, Australia, is different from what is followed at Bahria University, therefore following grade mapping mechanism is to be followed:

Macquarie University, Australia			Bahria University Old Grading System		Bahria University New Grading System	
Grade	Description	Marks	Grade	GP	Grade	GP
HD	High Distinction	85-100	A	4.0	A	4.0
D	Distinction	75-84	B+	3.5	A-	3.67
CR	Credit	65-74	B	3.0	B	3.0
P	Pass	50-64	C	2.0	C	2.0
PC	Conceded Pass	45-49	D	1.5	D	1.0
S	Satisfactory	NA				
F	Fail	Below 45	F	0.0	F	0.0
FH, I, W	Failed Hurdle Assignment, Incomplete, Withdrawn		F	0.0	F	0.0

* Due to lesser number of grades at Macquarie University, Grade B+, C+, C-, & D+ (new Grading system) of BU have been excluded

** For postgraduate students, BU equivalent grade D and below will be converted into an F grade

- d. The courses must equate in description and laboratory work, if any, with the similar course of the relevant academic program of Bahria University.
- e. **Credits transfer** of courses equating to maximum of 50% of the total credit hours of the relevant academic program of Bahria University will be allowed.

SOP for Inbound Exchange Students From Macquarie University, Australia

16. Bahria University will accept students from Macquarie University, Australia, under the exchange program in any given academic year. The maximum number of students to be accepted will be decided for each department in consultation with the Dean and relevant HoD.

17. Only students recommended by the International office of Macquarie University, Australia, will be entertained under this arrangement:

- a. The inbound students from Macquarie University, Australia, will be advised on the availability of courses, which they want to take at Bahria University, after consultation with the HOD of the relevant department. The HOD must ensure that there are no clashes between the selected courses by the individual.
- b. The student will be responsible for own accommodation arrangement in Pakistan, but the International office of BU will assist in finding suitable accommodation.

- c. To encourage more international students to join BU, there shall be no tuition fee charged by Bahria University from students of Macquarie University, Australia, under student's Exchange program.
- d. On successful completion of the course work at Bahria University, the student will be responsible to meet the **credits transfer** requirements of Macquarie University, Australia, as per its own policy. Bahria University will only award official interim transcript to the student for courses he / she has studied at Bahria University.

PRE-VISIT EQUIVALENCE FORM

CONFIRMATION OF COURSE TRANSFER AS A RESULT OF STUDENTS' EXCHANGE WITH MACQUARIE UNIVERSITY, AUSTRALIA

(DECISION AFTER PRELIMINARY MEETING OF THE EQUIVALENCE COMMITTEE)

Section A: Student Details:

Student Name:

Programme of Study:

Semester:

Enrolment No:.....

Campus: Islamabad ☐ Karachi ☐ Lahore ☐ ☐ IPP

Section B: Course Mapping

**List of courses planned to be studied at
Macquarie University, Australia**

**Transferable Courses at Bahria University,
recommended by the Equivalence
Committee:**

<u>Course Code</u>	<u>Course Title & Credit Hours</u>	<u>Course Code</u>	<u>Course Title & Credit Hours</u>
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.....
.....
.....

Section C: Student Declaration:

I fully understand that the final decision of transfer of courses will be taken on my return and will be conditional to successful completion of course work. In case any other course is studied, which is not stated in the list above (section B) then the decision for the transfer of credits for that course will be taken on my return, based on Credit Transfer procedure as specified in Bahria University SOP for Students' Exchange with Macquarie University, Australia.

Student's Signature

EQUIVALENCE COMMITTEE

Remarks: (If any)

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.....

.....

Member 1

Name:

Designation:

Member 2

Name:

Designation:

Member 3

Name:

Designation:

Head of Department

Director/Principal of Concerning Constituent Unit/School

***This form is to be forwarded to Director (IO), along with the copy of course outline of recommended programmes, which are transferable.**

POST-VISIT EQUIVALENCE FORM**CONFIRMATION OF COURSE TRANSFER AS A RESULT OF STUDENTS' EXCHANGE WITH
MACQUARIE UNIVERSITY, AUSTRALIA****Section A: Student Details:**

Student Name:

Programme of Study:

Semester:

Enrolment No:

Campus: Islamabad ☐ Karachi ☐ Lahore ☐ ☐ IPP**Section B: Course Mapping**

List of courses planned to be studied at

Transferable Courses at Bahria University,

Macquarie University, Australia

recommended by the Equivalence Committee:

<u>Course Code</u>	<u>Course Title & Credit Hours</u>	<u>Course Code</u>	<u>Course Title & Credit Hours</u>
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.....
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.....

Section C: Student Declaration:

I fully understand that the final decision on Transfer of Credits is subject to policy outlined in the Bahria University SOP FOR OUTBOUND EXCHANGE STUDENTS FOR MACQUARIE UNIVERSITY, AUSTRALIA

Student's Signature

EQUIVALENCE COMMITTEE

Remarks: (If any)
.....
.....
.....

Member 1

Name:

Designation:

Member 2

Name:

Designation:

Member 3

Name:

Designation:

Head of Department

Director/Principal of Concerning Constituent Unit/School

***This form is to be forwarded to Director (IO), along with the copy of course outline of recommended programmes, which are transferable, for approval.**

APPROVED/NOT APPROVED

Director Academics

SOP FOR OUTBOUND EXCHANGE STUDENTS FOR UNIVERSITY OF SILESIA IN KATOWICE, POLAND

1. Based on the maximum provision of students to be sent in an academic year, as permitted by University of Silesia in Katowice, Poland, there shall be students selected from each campus of Bahria University including, Islamabad, Karachi & Lahore, to go on the exchange program to University of Silesia in Katowice, Poland. The maximum number of students that can be recommended by any Campus would be based on the percentage of number of relevant students at that Campus. In case suitable candidate(s) are not available in a campus, the seat may be transferred to the other campus.
2. The recommendation of students is to be made by the following authorities:

<u>CAMPUSES</u>	<u>Nominating Authority</u>
BUIC	Director Admin BUIC (E-8)
BUKC	Director Admin BUKC
IPP	Director Professional Psychology
BULC	Director Campus Lahore
3. The above authorities will interview and shortlist students from their respective campuses based on following selection criteria, which should reflect the highest quality of students:
4. **Selection Criteria**
 - a. The students must be a regular student of Bahria University taking full course load.
 - b. The minimum CGPA of the student should be 3.0.
 - c. The student must have studied for more than a year (2 semesters) with Bahria University. Students in 2nd semester will be eligible to apply.
 - d. The student must be proficient in English and have good communication skills.
 - e. The student must not have any disciplinary cases against them and should be void of any attitude problem.
5. The shortlisted students will be re-evaluated by a following member committee at Bahria University to shortlist students for final approval of Rector:

Pro-Rector (Academics)	-	Chairperson
Registrar	-	Member
Director Academics	-	Member
Director Admissions	-	Member
Director Examinations	-	Member
Director Students Affairs	-	Member
Director International Office	-	Member
6. The selected students must sign a written bond with Bahria University to return to Pakistan to continue their remaining studies with Bahria University or to complete remaining degree requirements.
7. The responsibility of accommodation arrangement in Poland, during the course of stay, will be on student. The International office will assist the selected students in finding suitable accommodation. In addition to the expenses pertaining to accommodation, students will also be responsible for travelling & visa/pass expenses, medical/health insurance or any additional service charges they wish to avail or are required for travel to Poland for exchange programme.
8. The student will defer their semester prior going to University of Silesia in Katowice, Poland, under the Exchange Programme. There shall be no tuition fee charged for this process. The decision on duration & number of semesters, to defer, is to be taken by the relevant Head of Department according to number of days the student will spend at University of Silesia in Katowice, Poland, under exchange program. The student must adhere to departure and return dates as specified by his/her department.

9. The duration of the semester(s) studied abroad will not be counted towards the calculation of time bar.
10. **Eligibility for Honors & Awards.** Students availing the exchange programme at the University of Silesia in Katowice, Poland, will be eligible for academic honors & awards, as long as they are taking full semester loads in their studies at Bahria University and finishing remaining degree requirement with their batch of registration.
11. If, as a result of the exchange activity, any of their courses are affected, these students would be permitted to make up for the shortfall (of the affected courses only) on return to Bahria University either during the summer sessions, if offered, or during succeeding regular semester, in excess to their regular course load.
12. If during the summer session:
 - a. The students take shortfall courses, they will be awarded actual grades and no capping will apply.
 - b. The students take any course, which were not affected by the exchange programme, summer session rules will apply and the students will become ineligible for Honors & Awards.

Transfer of Credits as a result of an Outbound Exchange Program

13. Student interested in registering for the courses at University of Silesia in Katowice, Poland, for which they can avail **credits transfer** at Bahria University, shall be properly advised by the relevant Head of Department about the compatibility of the courses they wish to take, based on the course content, before departure.
14. The student must inform their Head of Department about the possible courses they wish to take at University of Silesia in Katowice, Poland, along with the course outline. A preliminary meeting of the Equivalence Committee should take place, before the departure of student. The committee shall give clear instructions to the student, in writing, on a prescribed form (attached), on the course(s) he/she can take to avail **credits transfer**, against course(s) of similar nature, at Bahria University as per the road map of the program he/she is studying.
15. The final decision on **credits transfer** is to be taken, on return of the student, and successful completion of the courses, as per following criteria:
 - a. Students applying for **credits transfer** are to submit original interim transcript and the course outlines of the course(s) studied at University of Silesia in Katowice, Poland, to their relevant Head of Department (HOD) on return. The HOD will then formulate an Equivalence Committee to make final recommendations to their relevant Director of Institute. The Director will then forward recommendation of the Equivalence Committee to Director International Office for processing case for final approval. There shall be no fee charged from the student for **credits transfer**.
 - b. **Credits transfer** of courses will only be allowed for Degree level programs (*equivalent to similar level program at Bahria University*) offered on campus.
 - c. **Credits transfer** for only those courses will be allowed for which a course with at least similar standard, credit hours and matching description is available in the relevant academic program of Bahria University. As the marking criteria at University of Silesia in Katowice, Poland, is different from what is followed at Bahria University, therefore following grade mapping mechanism is to be followed:

University of Silesia in Katowice, Poland		Bahria University Old Grading System		Bahria University New Grading System	
ECTS Grade	Local Grade	Grade	GP	Grade	GP
A	5 (Bardzo Dobry)	A	4.0	A	4.0
B	4,5 (+4 Dobry Plus)	B+	3.5	B+	3.33
C	4 (Dobry)	C+	2.5	C+	2.33
D	3,5 (+3 Dostateczny Plus)	C	2.0	C	2.0
E	3 (Dostateczny)	D	1.5	D+	1.33
F/FX	2 (Niedostateczny)	F	0.0	F	0.0

** Due to lesser number of grades at University of Silesia in Katowice, Grade A-, B, B-, C- and D (new Grading system) of BU have been excluded*

*** For postgraduate students, BU equivalent grade D (old grading system) & D+ (new grading system) and below will be converted into an F grade*

- d. The courses must equate in description and laboratory work, if any, with the similar course of the relevant academic program of Bahria University.
- e. **Credits transfer** of courses equating to maximum of 50% of the total credit hours of the relevant academic program of Bahria University will be allowed.

SOP for Inbound Exchange Students from University of Silesia in Katowice, Poland

16. Bahria University will accept students from University of Silesia in Katowice, Poland, under the exchange program in any given academic year. The maximum number of students to be accepted will be decided for each department in consultation with the Dean and relevant HoD.
17. Only students recommended by the International office of University of Silesia in Katowice, Poland, will be entertained under this arrangement.
18. The inbound students from University of Silesia in Katowice, Poland, will be advised on the availability of courses, which they want to take at Bahria University, after consultation with the HOD of the relevant department. The HOD must ensure that there are no clashes between the selected courses by the individual.
19. The student will be responsible for own accommodation arrangement in Pakistan, but the International office of BU will assist in finding suitable accommodation.
20. There shall be no tuition fee charged by Bahria University from students of University of Silesia in Katowice, Poland, under student's Exchange program.
21. On successful completion of the course work at Bahria University, the student will be responsible to meet the **credits transfer** requirements of University of Silesia in Katowice, Poland, as per its own policy. Bahria University will only award official interim transcript to the student for courses he / she has studied at Bahria University.

PRE-VISIT EQUIVALENCE FORM**CONFIRMATION OF COURSE TRANSFER AS A RESULT OF STUDENTS' EXCHANGE WITH UNIVERSITY OF SILESIA IN KATOWICE, POLAND**

(DECISION AFTER PRELIMINARY MEETING OF THE EQUIVALENCE COMMITTEE)

Section A: Student Details:

Student Name:

Programme of Study:

Semester:

Enrolment No:

Campus: Islamabad ☐ Karachi ☐ Lahore ☐ ☐ IPP**Section B: Course Mapping**

List of courses planned to be studied at

University of Silesia in Katowice, Poland

Transferable Courses at Bahria University,

recommended by the Equivalence Committee:

<u>Course Code</u>	<u>Course Title & Credit Hours</u>	<u>Course Code</u>	<u>Course Title & Credit Hours</u>
.....
.....
.....
.....

Section C: Student Declaration:

I fully understand that the final decision of transfer of courses will be taken on my return and will be conditional to successful completion of course work. In case any other course is studied, which is not stated in the list above (section B) then the decision for the transfer of credits for that course will be taken on my return, based on Credit Transfer procedure as specified in Bahria University SOP for Students' Exchange with University of Silesia in Katowice, Poland.

Student's Signature

EQUIVALENCE COMMITTEE

Remarks: (If any)

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.....

.....

Member 1

Name:

Designation:

Member 2

Name:

Designation:

Member 3

Name:

Designation:

Head of Department

Director/Principal of Concerning Constituent Unit/School

***This form is to be forwarded to Director (IO), along with the copy of course outline of recommended programmes, which are transferable.**

POST-VISIT EQUIVALENCE FORM**CONFIRMATION OF COURSE TRANSFER AS A RESULT OF STUDENTS' EXCHANGE WITH UNIVERSITY OF SILESIA IN KATOWICE, POLAND****Section A: Student Details:**

Student Name:

Programme of Study:

Semester:

Enrolment No:

Campus: Islamabad ☐ Karachi ☐ Lahore ☐ ☐ IPP**Section B: Course Mapping**List of courses planned to be studied at
University of Silesia in Katowice, PolandTransferable Courses at Bahria University,
recommended by the Equivalence
Committee:

<u>Course Code</u>	<u>Course Title & Credit Hours</u>	<u>Course Code</u>	<u>Course Title & Credit Hours</u>
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Section C: Student Declaration:

I fully understand that the final decision on Transfer of Credits is subject to policy outlined in the Bahria University SOP FOR OUTBOUND EXCHANGE STUDENTS FOR UNIVERSITY OF SILESIA IN KATOWICE, POLAND

Student's Signature

EQUIVALENCE COMMITTEE

Remarks: (If any)

.....

.....

.....

Member 1

Name:

Designation:

Member 2

Name:

Designation:

Member 3

Name:

Designation:

Head of Department

Director/Principal of Concerning Constituent Unit/School

***This form is to be forwarded to Director (IO), along with the copy of course outline of recommended programmes, which are transferable, for approval.**

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APPROVED/NOT APPROVED

Director Academics

AMENDMENT IN BU ACADEMIC RULES**7.17 Conduct of Examinations of a BU Student at CU other than Originally Registered**

7.17.1 In exceptional circumstances, a BU student may be allowed by Pro-Rector (Academics) to take *On-Campus* examination (only) at a CU other than where he/ she has registered for relevant semester; subject to consent by both CUs.

7.17.2 Application to this effect is to be submitted by the student at least 15 days prior the date of commencement of respective examination to concerned HoD, who will process the same with his/ her comments to Director Campus/ Director Academics (CU) through concerned Principal and Examination Department of the respective Campus.

7.17.3 Director Campus/ Director Academics (CU) will forward the case of such applicant at least 07 days prior to the commencement of respective examination to BUHO (Exams Dte) for consent of host CU and subsequent approval of Pro-Rector (Academics).

7.17.4 The CE will approach the host CU to conduct the examination as per student's request for its consent, followed by processing the case for approval of Pro-Rector (Academics).

7.17.5 After said approval, parent CU will intimate the examinations details along with its date sheet to host CU for necessary arrangements under intimation to the Exams Dte (BUHO). The date and time of parent CU shall be followed for all papers.

7.17.6 DD/ AD Exams of host CU will make arrangements for the venue, invigilation, etc, for the conduct of related examinations.

7.17.7 On the examination day, the student shall report to the office of DD/ AD Exams of host CU at least 30 minutes prior the start of paper as per date sheet intimated earlier.

7.17.8 Question paper for each subject/ course will be e-mailed by DD/ AD Exams of parent CU to DD/ AD Exams of the host CU immediately after the commencement of the paper at parent CU. DD/ AD Exams of host CU will get that paper printed and issue the same to the student along with the answer sheet. The file containing the question paper must be password protected, which may be shared between the DD / AD Exams of parent and host CUs through text message.

7.17.9 At the end of the paper time, the invigilator will collect the answer sheet from the student and submit the same to DD/ AD Exams of host CU.

7.17.10 DD/ AD Exams of host CU will seal the answer sheet in presence of the invigilator. The sealed envelope will be signed by invigilator and DD / AD Exams of host CU and dispatched to DD/ AD Exams of parent CU the same day, for marking by the concerned examiner / faculty member.

7.17.11 On receipt, DD/ AD Exams of parent CU will hand over the answer sheet to concerned examiner / faculty member for assessment and subsequent uploading the result on CMS with the results of other students of the same course. No additional time will be given to the examiner/ CU for marking/ submission of results to BUHO (Exam Dte) in this regard.

7.7.12 The above stated facilitation shall not be applicable to Re-Take examinations of all semesters or Annual/ Supplementary examinations of MBBS/ BDS programmes.

Inclusion of Govt/ Industry Experts as Members of BU ACMs

1. **Dr Farah Essa**
Physician

She is a multitalented woman, a physician and a singer. Educated and trained in Canada she has been leading departments and organizations in North America and the Middle East. She is also the founder, Regional Head & Director Radiology of Dr Farah Essa Academy, offering health care workers education and training at par with the North American standards, evolving Pakistani health care professionals to work internationally and nationally raising quality standards in all streams of health care.

She is the Maternal & Child Health Chair for Rotary District 3271 for the year 2020 and recipient of the “Women of Substance Award” from the Institute of Chartered Accountants Pakistan and also Canadian Health Achievement and the best faculty award in University of Toronto and Princess Nora University, KSA.

2. **Dr. Farzana Amir**
Physical Therapist Tabba Heart Institute

PhD (enroll in UoK)

Educational Background:

Advance training in Bio Ethics and public health-CKBTI-KEMRI by WHO and CBEC from Nairobi, Kenya. Advance course in Cardiac Rehabilitation and Sport Rehabilitation-ESC, Switzerland. Year PGD-Biomedical ethics (CBEC-SIUT), MBA-General management (PIMSAT) Doctor in Physical Therapy and Rehabilitation (UoK). Certification (One-year training) for Cardiac Rehabilitation Sudbury General Hospital, Ontario, Canada.

Academic Experience:

Certified Internal and external auditor for ISO. Faculty for NES and AHS, THI and RELATED TO Cardiac Rehabilitation, diet and life style Former BLS instructor for NES, THI. Pioneer in developing and conducting one-year training program for Physiotherapist for Cardio pulmonary Rehabilitation at THI.

University of Karachi –HPESS,

Visiting faculty for DPT programme

Administrative Experience:

At Tabba Heart Institute:

General Manager

Director, Allied Health Sciences

HOD, Department of Preventive Cardiology and Cardiac Rehabilitation and Dietary services

HOD, Marketing department

Director and faculty for Allied Health Sciences

3. **Dr. Rozina Karmaliani**

Dean, School of Nursing and Midwifery, Pakistan

Educational Background

PhD in Nursing and Master of Public Health the University of Minnesota, USA.

Academic experience

Dean and Professor at AKU-SONAM and a Faculty Member for the Medical College's Community Health Sciences.

She has worked for the Development and Promotion of Higher Education in Nursing in East Africa, Afghanistan, Syria and Egypt. Research Grants.

She has received various National and International Research grants worth more than USD 4 million and has 50 plus peer-reviewed key Publications in Journals of International repute.

4. Dr. Rubeena Kidwai Adjunct Faculty (NUST), Islamabad

Education

PhD in Clinical Psychology, 2002, California School of Professional Psychology, Los Angeles, California, USA.

Hubert H. Humphrey Fellowship August 2010 to June 2011, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA.

Experience

Director Training and Quality Assurance, Savaira – a division of The Soorty Foundation Adjunct Faculty, 2021 – To present, Department of Behavioral Sciences, School of Social Sciences and Humanities, National University of Sciences and Technology (NUST), Islamabad (Assistant Professor March 2013 to July 2016)

Associate Professor Dec 2011 – February 2013, PAF-KIET, College of Management Sciences, Korangi Creek, Karachi

Memberships

Member, Sindh Mental Health Authority (Honorary Position) December 2017 to date.

Member Advisory Board – Taskeen, Karachi, Pakistan November 2020 to date.

5. Khalid Rahman

Executive President and DG of the Islamabad-based think-tank, the Institute of Policy Studies. Mr. Khalid Rahman is Executive President and Director General of the Islamabad-based think-tank, the Institute of Policy Studies. The Institute's main areas of research include Pakistani society, domestic political scene, the economic perspective, Faith and Society and the global and regional geo-political situation. As Director General of the Institute, Khalid Rahman has over thirty years' experience of research, training and management. He is also editor of the IPS Journal 'Policy Perspectives.

6. Noshaba Awais

Fellowship Business Incubation Management (Incubation Management Queensland Brisbane Australia);

Master in Public Administration; Diploma in Business Administration

Director (BPS-19) -Research & Innovation Division,

- HEC. January 2016 till date Deputy Director (BPS18)-Research & Innovation Division.
- HEC. August 2009 – January 2016 Assistant Director (BPS17) -Research & Innovation Division,
- HEC. July 2006- August 2009 Assistant Director (BPS17)-Human Resource Development Division,

- HEC. 2003-2006 Assistant Director (BPS17)-Curriculum Division, University Grants Commission July 2001- May 2002.
- Field Coordinator-National Education Foundation June 1997 to July 2001.

PC1, Presidential Young Innovator Award 2004 – International Research Support Initiative (IRSIP) 2005, Scholarships for weaker universities 2005, Norway scholarships, Austria Scholarships, Repair and maintenance of scientific equipment, Talent Faring, Technology Development Fund. Projects & Research Grants: World Bank Grand Challenge Fund, World Bank Technology Transfer Support Fund World Bank Local Challenge Fund, World Bank Innovator Seed Fund , World Bank Center of Excellence Smart Cities project pitched and won from Asian Productivity Organization (APO) – Center of Excellence project developed in collaboration with NAHE and Virtual University pitched to APO (currently received revisions from APO).

HEC-France Peridot (mobility grant program) – HEC -Turkey (mobility grant program) Access to Scientific Instrumentation program – HEC Business Incubation Support program 2009 – Office of Research Innovation and Commercialization 2010-1. International & National Trainings & Capacity Building Workshops: Arranged/Attended 38 conferences/Training in various capacities i.e., keynote speaker, Trainer, Panelist and organizer Certified Courses and Fellowships “Business incubation management”, from university of Queensland Brisbane Australia. - “IP Licensing negotiation techniques learnt” held at Singapore 2014 Organized/Funded by CLDP, State Department of Commerce, USA.

7. **Prof Dr Rubina Ghani**

Professor Biochemistry in Jinnah Medical College in Sohail University Karachi.

Educational Background:

PhD in Biochemistry

Academic Experience:

Currently Professor of Biochemistry in Jinnah Medical College in Sohail University Karachi. She has been serving different institutes of Karachi since 27th Oct 2005 as teacher and a researcher. She has been working as a clinical biochemist, Molecular Biologist and stem cell specialist in different laboratories of Karachi as in Rahila Research & Reference Lab as Lab Manager & Consultant Molecular Biologist and Dr Mehdi A. Manji Pathological Laboratory.

Publications:

43 Research Publications in National and International Journal with High impact factor.

Supervisory Position:

She is HEC recognized supervisor and supervisor of 2 PhD and 5 MPHIL Scholars of Baqai Medical University & Ziauddin Medical University.

Workshop:

She has conducted and arranged various hands-on workshops on PCR, Stem cell techniques She is a member of thalassemia awareness program under umbrella of sylani welfare.

Director and CEO:

Musavvir stem cell clinic and Pathological Molecular Laboratories.

8. **Prof Mohsin Girach**

Consultant Maxillofacial Surgeon Taj Medical Complex.

Educational Background:

Bachelor of Dental Surgery from Liaquat university of Health Sciences Jamshoro. Fellowship in Oral Surgery from Royal College of Surgeons UK.

Academic experience:

Professor of OMFS at Jinnah medical & Dental College from 2000 to 2020. Associate Prof. at Baqai Dental College till 2000. Examiner at College of Physicians and Surgeons Pakistan. Former secretary board of studies at Karachi University for 15 years. PMDC Inspector for Dental college CPSP Inspector for Accreditation in the subject of Oral & Maxillofacial Surgery.

Administrative Experience:

Vice President Pakistan Association of Oral & Maxillofacial Surgeons from 2000-2017 Setting up of Jinnah Dental Hospital in 2000. Runs charitable dental OPD services in Shah Faisal colony. Organized multiple National & International Conferences. Advisor to Dental Equipment Manufacturing companies.

9. **Dr. Anila Amber Malik**

Professor

Education

PhD in Psychology, 2003. University of Karachi.

International Visitor Leadership Program USA, Alumna 2011

Experience

Convener, Higher Education Commission, Psychology Curriculum Committee for Associate Degree Program of Psychology, Undergraduate and Postgraduate Programs of Psychology and Clinical Psychology. March 2022.

HEC QAA Reviewer for MPhil and PhD Programs. 2017 - to date.

Chairperson, Department of Psychology, University of Karachi

Supervision: 19 PhDs and 15 MPhil Scholars

Memberships

Pakistan Psychological Association, Vice President Sind Chapter, 2010-2011, Executive Member 2021.

Member, Executive Committee of Pakistan Psychological Association

10. **Syed Murtaza Abbas**

MPhil (Government & Public & Policy), MBA (Finance).

Contact: +92308 8888392

Joint Director - Policy & Regulation Department, Lending NBFCs (Investment Finance Companies, Microfinance Companies, Housing Finance Companies) July 2019- Present.

Joint Director- Policy & Regulation Department, Asset Management Companies (AMCs) January 2018 – June 2019

Joint Director- Investor Education & International Relations July 2015 – December 2017

Deputy Director - Licensing & Supervision Department, Securities Market Division July 2010 – June 2015.

Deputy Director- Policy & Regulation Department (REITs, Leasing Companies and Investment Banks) Specialized Companies Division July 2007 – June 2010.

Deputy Director – Licensing & Capital Market Supervision, Securities Market Division February 2005 – June 2007.

Assistant Director - Stock Market Monitoring & Surveillance, Securities Market Division October 2001 – January 2005.

Competitive Grant Winner: Pakistan Strategy Support Program (PSSP) Competitive Research Grant (2013).

Teaching and Advisory Responsibilities: Member Corporate Advisory Board (IIUI); Member of Board of Studies, Pakistan Institute of Development Economics (PIDE), Islamabad; Adjunct faculty member at NUST Business School, IIUI and Quaid-I-Azam University.

Vocational Trainings & Conferences; International Organization of Securities Commissions (IOSCO) conference on “Emerging Capital Markets” - Istanbul, 2012; Franklin Covey’s “Seven Habits of Highly Effective People” – Islamabad, 2011; Study tour on “Best practices in REITs Industry – Malaysia, 2008; and Management Development Program – Islamabad, 2008.

11. **Syed Qamar Hussain Sabzwari**

Advocate Supreme Court Bachelor of Laws (LLB) Honors

University of London Bar Vocational Course (BVC)

University of West of England, Bristol +92 300 5000514

Email: sabzwariilaw@gmail.com

LL.B (Hon’s) from University of London (External Programme).

Bar Vocational Course (BVC) from University of the West of England, Bristol.

He was called to the Bar by the Honourable Society of Lincoln’s Inn.

Fellowship Program - Royal Melbourne Institute of Technology (RMIT) Public Private Partnerships.

An Associate- Raja Muhammad Bashir (Late), Advocate Supreme Court and former Prosecutor General, National Accountability Bureau (NAB)

Advisor legal- Infrastructure Project Development Facility (IPDF) (Now Public Private Partnership Authority (P3A).

He is an avid litigator and his areas of legal practice include but are not limited to Constitutional, Criminal, Regulatory, Corporate and Commercial Litigation, Alternative Dispute Resolution Arbitration, Mediation, Conciliation and Negotiation), Employment, Service, Family and Intellectual Property.

Present - Senior partner of Sabzwari Law Associates (A Law Firm headed by Syed Asghar Hussain Sabzwari, Senior Advocate, Supreme Court). Barrister Sabzwari regularly appears before the Honourable Supreme Court of Pakistan, Honourable High Courts across Pakistan, Election Commission of Pakistan, Tribunals and other Regulatory Authorities etc.

Academics- Regularly addresses seminars and webinars and also appears on electronic media. He has taught Public Law to the students of the University of London (External Programme) and an adjunct faculty member of National University of Science & Technology (NUST).

Selection - Recently been elected as Member of the Islamabad Bar Council (The Regulatory Authority for the legal fraternity of Islamabad). He bagged the largest number of votes, though being the youngest of the twenty-two (22) candidates contesting for the five seats of the Islamabad Bar Council.

ESTABLISHMENT OF BAHRIA SCHOOL OF PROFESSIONAL PSYCHOLOGY (BSPP) AT BUIC

Background of the Case

With the growing importance of psychology in the modern education system and increasing public demand, the Department of Professional Psychology was established at Bahria University, Islamabad campus in the Fall-2014. Initially, the department was started with limited resources and mandate. Classes of the MS Program in Clinical psychology commenced in Fall 2014. The BS in Psychology Program was started in the Fall-2016 and the Ph.D. in Clinical Psychology program was launched in Spring-2017. Currently, the department is offering a complete range of educational programs (Bachelor to Ph.D.) and offers MS and PhD programs specialization in Clinical Psychology. The department needs to expand a full fledged school of psychology at BUIC to meet the growing needs of society.

Need for a School of Professional Psychology at BUIC

In Pakistan, the subject of psychology is gradually gaining importance due to changing HR practices and increasing demand for counselors/psychologists in government, business, educational institutions, and other organizations. Furthermore, the changing socioeconomic, environmental, and rapid technological developments would demand a larger workforce in the field of psychology in near future. Presently most of the Universities in Pakistan are offering BS, MS, MPhil, and Ph.D. programs in clinical psychology. Most of the other branches or programs of psychology are still untapped in Pakistan. Currently, IPP BUKC is offering MS in Clinical Psychology and MPhil & Ph.D. Professional Psychology (Clinical, Organizational, and Educational Psychology). NUST, Air University, Riphah University, IIUI are mostly offering MS/MPhil in Clinical Psychology. Considering the market demand, BUIC may upgrade and expand its department of psychology into a larger entity i.e., the School of Professional Psychology.

Vision: To become an internationally recognized School by achieving excellence in Professional Psychology that contributes toward the development of society.

Mission: To positively contribute towards psychological well-being of the society by achieving excellence in academics through creative thinking, applied research and professional practices supported through linkages with industry and international community.

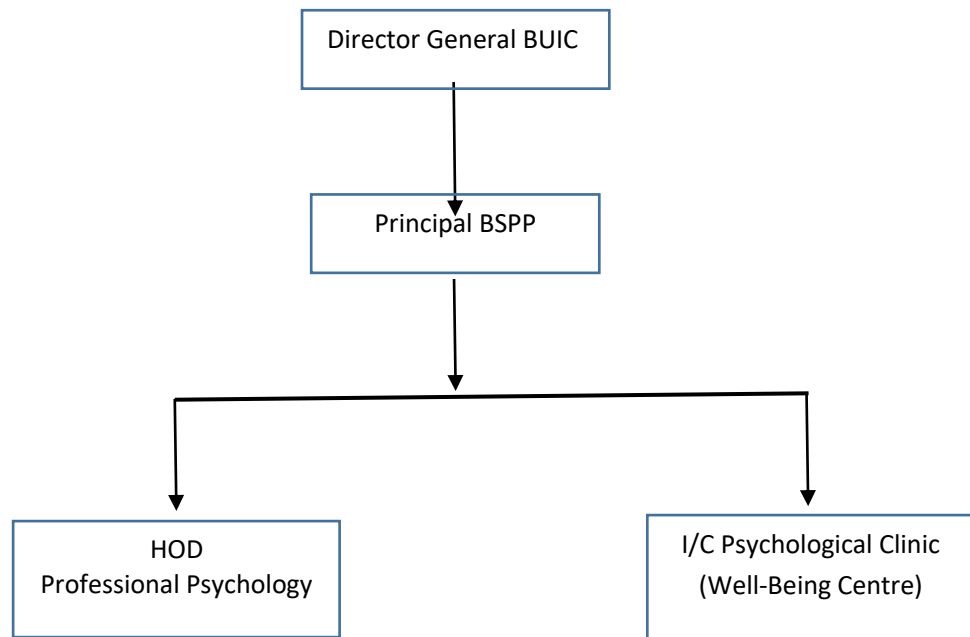
Change in Monikar: Department of Professional Psychology, BUIC will be renamed as ***Bahria School of Professional Psychology (BSPP)***.

Logo: A new logo will be developed.

Organogram: As proposed on next page.

Recommendations: The establishment of a School as proposed is recommended.

Proposed Organogram of Bahria School of Professional Psychology (BSPP)



Appendage 4222**Amendments in BU Academic Rules 7.9.6 and 7.10.3**

Amendments in BU Examinations Policy for the methodology to record the re-examinations of PNSL students in their Final Transcript have been approved in 41st ACM held on 7-9 May 2022. Corresponding amendments in BU Academic Rules are hereby submitted for approval by the Academic Council, and ratification by the Executive Committee:

BUAR	Replace	With
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 Retake/ Supplementary/ Make-up/ Re-Examination.	Undergraduates of BU academic programs enrolled in CUs administratively and financially under the Naval Headquarters are to follow relevant rules for Retake/ Supplementary/ Make-up/ Re-Examination contained in BU Examination Policy.
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.	Undergraduates of BU academic programs enrolled in CUs administratively and financially under the Naval Headquarters are to follow relevant rules for Relegation/Withdrawal contained in BU Examination Policy.