Curriculum

Department of Geography and Environment

Graduate
Session: 2024-25

Shahjalal University of Science and Technology
Sylhet, Bangladesh

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OVERVIEW OF THE UNIVERSITY AND DEPARTMENT

(At a glance)

Name of the University
Shahjalal University of Science and Technology, Sylhet

Establishment of the University
25 August 1986

Founder Vice Chancellor of the University
Professor Dr. Sadruddin Ahmed Chawdhury

Current Vice Chancellor of the University
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First Academic Session of the University
1990-1991

Website of the University
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Name of the Department
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First Academic Session of the Department
2010-11

Website of the Department
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PAB Extension of the Department
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Founder Head of the Department
Professor Susanta Kumar Das

Current Head of the Department
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Programs Offering
BSc (Honors), MS

FACULTY LIST (Current)

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Associate Professor:			
01.	Dr. Md. Anowarul Islam	2410	01709109665
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03.	Rony Basak		01715545225
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05.	Nusrat Jahan Koley		01829671957
06.	Md. Tariqul Islam		01913077326
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10.	Towfiqul Islam Khan		01674330886
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14.	Jannatun Nayem		01682911309
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Ordinance of Graduate Program (OGP)

For the Session 2024-2025 and onward

Shahjalal University of Science and Technology, Sylhet

Upon the approval of this ordinance, the preceding one, inclusive of all amendments, shall be deemed null and void. However, this action shall not impact ordinances or resolutions pertaining to matters not addressed herein.

I. Formation of GSC and its function

The formation of a Graduate Studies Committee (GSC) is a prerequisite for initiating a Graduate Program in any Discipline or Institute. The GSC shall consist of all Professors and/or Associate Professors within the Discipline, with a minimum of three (3) Professors or Associate Professors and shall be chaired by the Head/Director of the Discipline/Institute. In cases where an adequate number of Professors and/or Associate Professors are not available within a Discipline, the Dean of the School, in consultation with the Head of the Discipline, shall propose a sufficient number of Professors or Associate Professors from other Disciplines/Institutes and will take necessary steps for getting approval by the executive committee of the School. The Dean will then send the formed GSC committee to the Board of Advanced Studies (BAS) for subsequent approval by the Academic Council (AC).

The GSC will undertake administrative duties and play a significant role in organizing the ceremonial aspects of the graduate program. The Head of the Discipline (HoD) will appoint a faculty member from the GSC as the Graduate Program Coordinator (GPC), who will assist the GSC in program management. The HoD may appoint an officer to manage the relevant files of the offered programs to assist GPC. The GPC, under the guidance of the GSC Chair, will maintain a centralized file for each cohort of Master's students. Separate files will be opened for individual students enrolled in Master's by Research and PhD programs.

II. Nature of Graduate Program and the nomenclature of the Degree

II.1 SUST graduate program offers three distinct pathways to a Master's degree: Master's by Coursework, Master's by Mixed Mode (with options for a dissertation), and Master's by Research. A Master's by Research program is primarily centered around the development of a dissertation or dissertation, with the possibility of including some taught components. However, it is important to note that any taught components within this program are non-credit bearing, and the students' evaluation is solely based on their dissertation or dissertation work. In contrast, a Master's by Mixed Mode program comprises a minimum of 18 credit hours of instructional coursework, complemented by a research component that demands the completion of a dissertation or dissertation. In this mode, a student's overall assessment is contingent on their performance in both the instructional courses and the research component. Finally, a Master's by Coursework program involves a curriculum primarily comprised of taught courses, with a minimum requirement of 40 credits.

The doctoral program offered at SUST is Doctoral by Research. At the Doctoral by Research, there is no minimum credit requirements for coursework. It is important to note that across the doctoral-level qualification, the culminating requirement is the completion of a substantial dissertation.

Specific credit requirements and duration limits of each program have been depicted in the table below:

Table: Credit requirements and duration of each of the postgraduate programs

Program Type	Credit Requirement				Program Duration			
	Course work (Min.)	Dissertation (Min.)	Dissertation (Max.)	**Total (Min.)**	Semester (Min.)	Year (Min.)	Semester (Max.)	Year (Max.)
Master's by Course work	40	-	-	**40**	2.0	1.0	4.0	2.0
Master's by Mixed Mode	18	12	16	**40**	3.0	1.5	6.0	3.0
Master's by Research	Non-credit (if offered)	48	-	**48**	4.0	2.0	6.0	3.0
Doctoral by Research	Non-credit (if offered)	72	-	**72**	6.0	3.0	12	6.0

II.2 Notification for the admission process in post graduate programs will be published once a year.

II.3 Each student enrolled in Master's (by Mixed Mode & by Research) and in PhD Program will be assigned a dedicated Supervisor from the teachers of their Discipline to provide guidance throughout their academic program.

II.4 Any Discipline or Institute may offer a Master's program, provided it can ensure that its teaching personnel, whether from the same Discipline or others, hold qualifications equivalent to an Assistant Professor with a Ph.D. or higher. However, for offering Master's by Research and PhD. programs, the Discipline must ensure the availability of qualified individuals, either from its own faculty or from related Disciplines, who hold the rank of Associate Professor or higher to supervise graduate research work.

II.5 The name of the degree of a program should be related to the offering Discipline. However, allied subject/title can be offered upon prior approval of the School.

For instances:

i. Students who will successfully complete the Master's program within the Disciplines of the School of Social Sciences (excluding Language Discipline) will be conferred the degree as Master of Social Science in Sociology (Coursework), Master of Social Science in Sociology (Mixed Mode).

   For Language Disciplines: Students completing the Master's by Coursework or by Mixed Mode (with options for a dissertation) program within a language Discipline (such as Bangla or English) will be awarded the degree: Master of Arts in Bangla (Mixed Mode), Master of Arts in English (Coursework), and so forth.

ii. The students who will complete the Master's program within the Discipline of the School of Physical Sciences, Life Sciences, and Agriculture and Mineral Sciences will be awarded the degree as Master of Science in Physics (Coursework), Master of Science in Physics (Mixed Mode), Master of Science in Forestry and

Environmental Science (Coursework), Master of Science in Forestry and Environmental Science (Mixed Mode), Master of Science in Genetic Engineering and Bio Technology (Coursework), Master of Science in Genetic Engineering and Bio Technology (Mixed Mode) and so on.

iii. The student who will complete the Master's program within a Discipline under the School of Applied Sciences and Technology will be awarded the degree as Master of Engineering in Chemical Engineering and Polymer Science (Coursework), Master of Engineering in Chemical Engineering and Polymer Science (Mixed Mode), Master of Engineering in Computer Science and Engineering (Coursework), Master of Engineering in Computer Science and Engineering (Mixed Mode) and so on.

II.6 A graduate program could be offered by a discipline in a specific field through collaboration with reputed foreign Institutes or universities, subject to the conditions outlined by the Academic Council, tailored to each individual case.

II.7 Graduates of the Master's by Research program will receive a degree, the title of which will vary depending on the School, Discipline, and specific module attended by the student.

For instances:

i) Students who have successfully completed the Master's by Research program within Disciplines other than those under the School of Applied Sciences and Technology will be conferred degrees such as: Master of Philosophy in Sociology, Master of Philosophy in Social Work and Master of Philosophy in Physics, Master of Philosophy in Biotechnology, Master of Philosophy in Bangla and so on.

ii) Students who have completed the Master's by Research program within a Discipline under the School of Applied Sciences and Technology will receive degrees such as: Master of Science in Chemical Engineering and Polymer Science, Master of Science in Chemical Engineering, Master of Science in Disaster Management, Master of Science in Industrial Engineering, Master of Science in Software Engineering and so on.

II.8 A student completing a Doctoral by Research program will be awarded the degree as Doctor of Philosophy in [name of the broader area the dissertation work belongs to], such as Doctor of Philosophy in Social Sciences, Doctor of Philosophy in Physical Sciences, Doctor of Philosophy in Biological Sciences, Doctor of Philosophy in Engineering Sciences, Doctor of Philosophy in Literature, Doctor of Philosophy in Industrial Engineering, and so forth.

In the PhD certificate, the name of the degree will be associated with the program offering entity in the following format: Doctor of Philosophy in Social Science, Department of Social Science, Doctor of Philosophy in Information Technology, Institute of Information and Communication Technology, Doctor of Philosophy in Literature, Department of Bangla, and so forth.

III. Course Identification System for Graduate Program

III.1 Formation of Curriculum Committee

Curriculum committee for the postgraduate programs will be comprised of the GSC members, one expert member from the industry/employers, one expert member from alumni, and two external members from other universities nominated by the Dean.

III.2 Course Development

III.2.1 Core, Elective and General Education Courses: The curriculum committee of the Discipline, duly formed by the respective Dean, will develop all the courses of the curriculum for every session. These courses include the Core, General Education, and Elective courses needed for the program of the Discipline. The General Education courses will be developed with close consultation with the respective Discipline concerned, considering the nature and demand of the program. If, for any of the Disciplines, the needed General Education courses are not running/operating in the University then the curriculum committee of that Discipline will develop all the necessary/relevant courses for the program. Finally, the curriculum has to be approved by the respective School, the Board of Advanced Studies, and the Academic Council.

III.2.2 Curriculum: The curriculum committee will be responsible for the selection and approval of courses, including both Core and Elective courses within the Discipline, as well as General Education courses offered within and by other Disciplines, to form the comprehensive curriculum. A student must successfully complete all core courses and general education courses to be eligible for graduation, even if they have accrued the necessary degree credits. Additionally, the Committee may assign prerequisite requirements to certain courses if deemed necessary.

III.2.3 Course Instruction: At the beginning of every semester, the course instructor has to prepare a detailed course outline and submit it to the Head of the Discipline and make it available for the students. The course plan should have information about the suggested textbooks, topics per week and corresponding course learning outcomes (COs) covered, teaching and learning strategies, assessment strategies, number and approximate dates of term-test examinations, quizzes, presentations, and mandatory office hours reserved for the students of the course offered, etc. If not otherwise mentioned, the medium of instruction is always English.

III.3 Course Identity:

Each course is specified/designated by a three-letter symbol for Discipline/School abbreviation (if not otherwise mentioned) followed by a four-digit International Standard Classification of Education (ISCED) code and a four-digit number to characterize that course. To avoid confusion, any new or modified courses should never be specified/designated by reusing a discontinued course number.

III.3.1 Discipline Identification

The three-letter symbol will identify a Discipline/Institute/School offering the course as follows. If the same course is offered to more than one Discipline/Institute, if necessary, an extra letter shown in the list may be used after the four digits to specify the Department receiving the General Education course.

SL No.	Identifier	School of Applied Sciences and Technology:	Extra Letter
1.	ARC	Architecture	A
2.	CEP	Chemical Engineering and Polymer Science	B
3.	CEE	Civil and Environmental Engineering	C
4.	CSE	Computer Science and Engineering	D
5.	EEE	Electrical and Electronic Engineering	E
6.	FET	Food Engineering and Tea Technology	F
7.	IPE	Industrial and Production Engineering	G
8.	MEE	Mechanical Engineering	Q
9.	PME	Petroleum and Mining Engineering	H
		School of Life Sciences:	
10.	BMB	Biochemistry and Molecular Biology	I
11.	GEB	Genetic Engineering and Biotechnology	J
		School of Physical Sciences:	
12.	CHE	Chemistry	K
13.	GEE	Geography and Environment	L

14.	MAT	Mathematics	M
15.	PHY	Physics	N
16.	STA	Statistics	O
17.	OCG	Oceanography	S
		School of Social Sciences:	
18.	ANP	Anthropology	a
19.	BNG	Bangla	b
20.	ECO	Economics	c
21.	ENG	English	d
22.	PSS	Political Studies	e
23.	PAD	Public Administration	f
24.	SCW	Social Work	g
25.	SOC	Sociology	h
		School of Agriculture and Mineral Science:	
26.	FES	Forestry and Environmental Science	P
		School of Management and Business Administration:	
27.	BUS	Business Administration	i
		Institute of Information and Communication Technology:	
28.	SWE	Software Engineering	W

III.3.2 Course Number

(a) Following the BNQF (Bangladesh National Qualifications Framework) guidelines, an ISCED Code will be assigned to each course (offered by the Discipline/Institute/School) immediately after the three-letter Discipline code of the specified course.

(b) First Digit: The first digit of the four-digit number, after the ISCED Code, will correspond to the year intended for the course recipient.

(c) Second Digit: The second digit of the four-digit number, after the ISCED Code, will correspond to the semester intended for the course recipient.

(d) Third Digit: A Discipline should use the numbers 0 and 1 for the third digit to identify allied General Education courses. The digits 2-9 are reserved for Core and Elective courses to identify the different areas within a Discipline/Institute.

(e) Fourth Digit: The fourth digit of the four-digit numbers, after the ISCED Code, will identify a course within a particular Discipline/Institute/School. This digit may be sequential to indicate the follow-up courses. If possible, fourth digit may be even for identifying the laboratory/sessional courses of the Discipline/Institute/School.

III.3.3 Course Title and Credit: Every course will have a short representative course title and a number indicating the total credit as well as reference to prerequisite courses, if any.

III.4 Assignment of Credits:

III.4.1 Theoretical: One lecture of 1 (One) hour duration per week or 14 (Fourteen) lectures in total per semester will be considered as one credit.

III.5 Classification of the Courses: The Master's (Coursework and Mixed Mode degree programs) courses will be classified into several groups, and the curriculum committee will finalize the curriculum by selecting courses from the groups shown below.

III.5.1 Core and Elective Courses: Every student has to take the courses specified as core courses of the program offered by the Discipline/Institute. The percentage of the core and elective courses shall be at most 90% of the total credits so designed by the respective Discipline/Institute.

III.5.2 General Education Courses: Every student is required to take General Education courses developed by the Curriculum Committee of the Discipline/Institute. The General Education courses shall be at least 10% of the total credits offered by the respective Discipline/Institute. If any General Education course is declared as a mandatory course in the curriculum, a student is required to take that course to complete his/her degree.

III.5.3 Non-credit Courses: The credit of these courses will not be added to the total credits if passed and will have no effect on the CGPA as there will be no grades for these courses.

IV. Ethical Issues:

IV.1 Ethical Issues involved in Dissertation Supervision and Evaluation:

a) A faculty member or a designated person cannot supervise a PhD candidate or a candidate for Master's Program either by Mixed Mode or by Research as a Supervisor/Co-Supervisor if s/he is a close relative (Husband/Wife, Father/Mother, Brother/Sister, Son/Daughter, Nephew/Niece, First Cousin, In-laws) to the candidate.

b) Any panel examiner (Internal/External) of dissertation of any postgraduate program should not be the close relative (mentioned in (a)) of the Supervisor. The Supervisor and the GSC should carefully propose the panel of examiners to avoid conflict of interest.

c) Neither the Supervisor nor the candidate may communicate with the examiner regarding the examination at any stage of the process.

d) If either the HoD or Dean is a Supervisor of the candidate, an alternative must be nominated and appointed as the Chair of the oral examination committee.

e) If a Chairman of GSC is a candidate for PhD, he/she cannot conduct the GSC meeting and cannot act his/her role as GSC Chair or Present in a BAS meeting (if member) wherever there is an agenda regarding his/her PhD either for supervision, committee formulation, examination and other relevant aspects mentioned in the ordinance. Alternative must be set by the respective Dean of the School from the Members of relevant GSC. The same provision is to be applied in case of a Member of GSC.

f) A student may never be asked any question that may hurt her/his religious or ethnic background/identity throughout his/her program conduction.

IV.2 Ethical Issues involved in Course/Lab/Sessional Examination

IV.2.1 Everyone involved in the process of the examination shall guard the confidentiality of the question papers, examination grades, and results. The examinee, under any circumstance, cannot try to tamper with the examiners. Such attempts of the examinees shall be brought to the attention of the Controller of Examinations.

IV.2.2 If someone involved in offering a course or in the examination process having the following relatives as examinees, s/he shall inform the Head of the Discipline and the Controller of Examinations or the controlling authority immediately (a) Husband/Wife (b) Son/Daughter (c) Brother in law/Sister in law (d) Son in law/Daughter in law (e) Nephew/Niece (1) Uncle/Aunt (g) First cousins (h) brother/sister.

IV.2.3 Compliance: A student (clearing graduate) may appeal to the Controller of Examinations to (re)examine his/her answer scripts for a maximum of 2 (two) theory courses within 2 (two) weeks after the publication of the result. In this case s/he must pay a fee determined by the Academic Council filling the prescribed form supplied by the office of the Controller of Examinations. Then, based on the appeal, two examiners (except the previous examiners) will be appointed soon by the Grievance Cell, and the Controller of Examinations will take the approval from the Vice- Chancellor. In case of the single examiner system (SES), two examiners will evaluate two answer scripts A and B (of the appealed course) separately, and their given Marks will be added together for obtaining the total mark. Whereas for the double examiner system (DES). two examiners will evaluate the single answer script (of the appealed course) separately, and then the two Marks will be averaged. If the present total/average mark is at least 10% less or higher than the previous total/average mark, only then, the Grievance Cell will ask the concerned Examination Committee and the Controller of Examinations to revise the grade of the applicant. Otherwise, her/his previous grade shall stand.

V. Dispute Resolution about Course Examination and Evaluation of Dissertation:

During the program, a student may have dispute about the outcome of the relevant assessment. To resolve
such issue, there will be a Grievance Cell for graduate program to address the issue and make recommendation for mitigating and/or resolving the dispute to the BAS.

V.1 Grievance Cell

In each Discipline for exam-oriented compliance, a four/five members' committee as in the following will be formed:

Dean of the School	: Convener
Head of the Discipline (if not examiner or candidate)	: Member
Two senior faculties (not examiners) nominated by the GSC	: Member
The Controller of Examinations	: Member Secretary

V.1.1 If a candidate of postgraduate program believes that he/she has been significantly disadvantaged by examination process, or by any part of the examination process, then a written appeal may be made to the Chairman of GSC stating the relevant ground providing the supportive documents. GSC will send the matter with the materials submitted in appeal to the Grievance Cell to deal with.

V.1.2 After making a recommendation, the Convener of the Cell will send the summary as a report to BAS for approval.

A. Master's by Coursework

A1 Eligibility

A1.1 Graduates with a Bachelor's degree in a relevant Discipline from SUST are eligible to apply for the Master's by Coursework program.

A2 Admission

A2.1 The candidate for this program must submit the following documents: (i) application in the prescribed form, (ii) academic transcript, and (iii) consent letter from the employer, if applicable.

A2.2 After selecting the candidate for this program, the Graduate Study Committee (GSC) will then send all the documents mentioned in Clause A2.1 to the Board of Advanced Studies (BAS) through the Dean of the School for subsequent approval by the Academic Council (AC).

A3 Registration

A3.1 A student enrolled in this program must register for a minimum of 10 (ten) credits and a maximum of 20 (twenty) credits per semester.

A3.2. A SUST faculty member may be admitted to this program with prior approval from the University Authority.

A3.3 The registration for this program will remain valid for a maximum of 4 (four) semesters.

A3.4 The period of candidature for this program will remain valid for a maximum of 2 (two) academic years.

A4 Academic Calendar

A4.1 Number of Semester

There will be two semesters in an academic year. The first semester of the year will start on 1st January and end on 30th June, the Second semester will begin on 1st July and end on 31st December. The roster of the final examination dates and other academic deadlines will be announced at the beginning of each semester.

A4.2 Duration of Semesters:

The duration of each semester will be as follows:

Classes	14 weeks
Recess before final Examination	2 weeks
Final Examination	4 weeks (Max.)
Semester Break for the Result Processing and Publication	2 weeks
Total	22 weeks

These 22 (Twenty-two) weeks may not be continuous in order to accommodate various holidays and the recess before the final examination.

A5 Course Pattern

Master's by Coursework program has been structured around a series of theoretical courses. At the beginning of every academic session, a short description of courses will be published by the curriculum committee of each Discipline.

A6 Academic Regulations: The Master's by Coursework program is exclusively structured around theoretical courses. In this mode, a student's overall assessment is dependent on his/her performance in these instructional courses. The minimum duration and total credits required for the degree will remain consistent across all Schools, as outlined below.

Table: Credit requirements and duration of Master's by Coursework program

Program Type	Credit Requirement				Program Duration			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Total (Min.)	Semester (Min.)	Year (Min.)	Semester (Max.)	Year (Max.)
Master's by Coursework	40	-	-	40	2.0	1.0	04	2.0

The course structure for this program will be designed by the GSC and approved by the relevant school.

A6.1 Duration: Minimum duration for this degree is 2 (two) semesters.

A6.2 Credit Requirement: To attain the Master's by Coursework degree, students are required to fulfill a minimum of 40 credits through coursework instruction.

A6.3 Course Requirement: Students enrolled in the Master's by Coursework program must complete a minimum of 40 credit hours of instructional coursework. The GSC may recommend required courses, but not more than 12 (twelve) credits, from the graduate and/or undergraduate levels from other Disciplines.

A6.3.1 Lab Course: While initially optional, once integrated into the program structure, this component will become mandatory for students. Instruction will be conducted collectively with all students of the batch or in multiple groups. Each course of this nature will carry 1 to 2 credits.

A6.4 Incomplete Courses: If a student has any incomplete course(s), s/he has to register that incomplete course(s) from preceding semesters before registering courses from current or successive semesters. If an incomplete course is not available or offered in the running semesters, the student shall take such course(s) when it is available or offered.

A6.5 Course Withdrawal: A student can withdraw from a course by a written application to the Controller of Examinations through the Head/Director of the Discipline/Institute two weeks before the examination start. The Controller of Examinations will send the revised registration list(s) to the Disciplines before the commencement of semester final examination. There will be no record in transcript if the course is withdrawn.

A6.6 Course Repetition: If a student has to repeat a failed or incomplete course and that course is not available/offered any more, the Discipline may allow him/her to take an equivalent course from the current curriculum. For clearing graduates, if any incomplete course is not available/offered in the running semester, the Discipline may suggest a suitable/equivalent course to complete the credit required for the degree.

A6.7 Special Semester: Students with any retake or re-retake course(s) may apply for a special semester to complete the total required courses, with a maximum limit of twelve (12) credits during that semester. A special semester will be offered for final semester students who have retake or re-retake courses. The examination will commence four (4) weeks after the publication of the result and will continue for a maximum of two (2) weeks. The marks for both attendance and continuous assessments will be carried over from the previous record.

A7 Examination

Under this program, students will undergo continuous evaluation. In theoretical classes, assessment methods include class participation, assignments, quizzes, mid-semester examinations, topic-based report writing/presentation, and a final examination at the end of the semester. Laboratory/sessional work will be evaluated through observation, viva-voce sessions, lab quizzes, written reports, and examination grades determined by the course instructor and examination committee.

A7.1 Examination Committee

A7.1.1 The Graduate Studies Committee (GSC) of the Discipline or Institute will form a 06(Six) members examination committee for Master's by Coursework and Master's by Mixed Mode which is as follows:

Chairman: A teacher not bellow the rank of Professor of the GSC, in absence of Professor of the Discipline, an Associate Professor/Head of the Discipline. Head of the GSC will be the Chairman of the terminal semesters.

Internal Members: 04 (four) teachers from the members of the GSC.

External Members: One teacher/expert (not below the rank of Professor or equivalent) of the Major field and one teacher from each of the Disciplines offering the general education courses.

The respective Deans will ratify the list of the examinations committees and send to the Registrar for approval from the Academic council (AC).

A7.1.2 The examination committee proposes the examination schedule, finalizes question papers, assists the Discipline in conducting the examinations, preparing results, and addressing any issues that may arise regarding the examination procedure.

A7.2 Examination Dates and Routines

A7.2.1 The respective Disciplines will prepare the examination schedules, and the Heads of the Disciplines will notify them and distribute copies to other relevant Disciplines, as well as to the Office of the Controller of Examinations.

A7.3 Theory Courses

A7.3.1 Distribution of Marks: The marks of a given course will be as follows.

1.	Class Attendance	10%
2.	Class performance (Quizzes/MCQ/fill in the gap/report writing/ presentation/Assignments)	10%
3.	Mid-Semester Examinations	20%
4.	Final Examination Note: A student must obtain at least 25% of Marks allocated to final examination to pass the course	60%

A7.3.2 Class attendance: The marks for class attendance will be as follows:

Attendance (Percentage)	≥ 95	90 – < 95	85 – < 90	80 – < 85	75 – < 80	70 – < 75	65 – < 70	60 – < 65	50 – < 60
Marks	10	9	8	7	6	5	4	3	0

A student will not be allowed to appear the final examination of a course if his or her class attendance in that course is less than 50%.

A7.4 Mid-Semester Examination: There should be at least two Mid-Semester examinations for every theory course. The course teacher may decide the marks distribution of the Mid-Semester examinations. The answer scripts must be shown to the students as it is essential to their learning process.

A7.5 Question Setting and Moderation

A7.5.1 The Examination Committee will propose two question setters for each course to the Dean for appointment, at least four weeks prior to the examination commencement date, and subsequently inform the Controller of Examinations. The Controller of Examinations

will then provide the necessary documents to the appointed question setters and examiners. In the event that a question setter or examiner declines the responsibility, they are required to return all documents, upon which the Examination Committee will propose an alternative question setter or examiner.

A7.5.2 The Chairman of the examination committee shall receive all the manuscripts of question papers. Should no manuscript be received within the stipulated timeframe, the committee will proceed to recommend an alternative question setter.

A7.5.3 After receiving all question paper manuscripts, the examination committee will proceed to moderate them. The committee is tasked with editing and printing the final question papers.

A7.6 Question Structure: Each Discipline must follow one unique question structure for final examinations. For 3.00 (three) or 4.00 (four) credits theory courses: (a) the written (final) examinations will be conducted for 60 marks, (b) there will be six questions for Double Examiner System (three questions in each part of the question paper for Single Examiner System), and the examinees will be asked to answer all of them, and (c) the examination time/duration will be 3 (three) hours. However, for 2.00 (two) credits theory courses: (a) the written (final) examination will be conducted for 60 marks, (b) there will be four questions for Double Examination System (two questions in each part of the question paper for Single Examination System), and the examinees will be asked to answer all of them, and (c) the examination time/duration will be 2 (two) hours. However, in the case of a Double Examiner System, two questions with alternative questions will be given. In the case of a Single Examiner System, only one question with an alternative question will be provided in each part (Part A and Part B) of the question paper. The serial number, question number, assigned marks, related course learning outcome (CO), and Bloom's level of the questions must match in both the main question and the corresponding alternative question (in cases where a question consists of multiple sub-questions). For instance:

Question Number	Question(s)	Consider these ARBITRARY		
		Assigned Marks	Related CO	Bloom's Level (BL)
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				
OR				
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				

OR

Question Number	Question(s)	Consider these ARBITRARY		
		Assigned Marks	Related CO	Bloom's Level (BL)
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
OR				
	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
OR				
	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
OR				
	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				

The GPA calculation will follow clause A7.3.1 during the result processing. Question setters are liable to set questions covering the entire curriculum of the course, and the examination committee shall have the liberty to investigate it and to do other necessary corrections during moderation. Moderated question paper must be printed and supplied to the examinees.

A7.7 Final Examination: After the 16th week since the beginning of the semester, the final examination will be conducted as per the Postgraduate Examination Ordinance.

A7.7.1 Duration of the Final Examination: There will be a 3-hour final examination for every course of 3-4 (three-four) credits, and the courses less than 3 (three) credits will have a final examination for 2 (two) hours duration.

A7.7.2 Evaluation of answer scripts of final examination: The School of Disciplines may follow any one of the following answer script evaluation system.

(1) Single Examiner system, SES: The students will have two answer scripts to answer a separate set of questions during the final examination. Two examiners will grade the two answer scripts separately, and their given marks will be added together (examinee wise) for determining the Final Mark.

(2) Double Examiner system, DES: The students will have a single answer script to answer questions during the final examination. The answer scripts will be evaluated by two examiners separately. For determining the Final Mark: (1) If the difference of two marks of the examiners is less than 20%, then these two marks will be averaged, and (2) If the difference of two marks of the examiners is 20% or more, the corresponding/concerned answer scripts will be examined by a third examiner and then the closer (by smaller difference) otherwise higher two marks of the three examiners will be averaged. Furthermore, if the total marks of two examiners differ by 15% or more in the case of 50% or more answer scripts of a course, then the whole set of answer scripts will be examined by a third examiner.

The examination committee will propose the name for appointing the third examiner(s) (not any member of the examination committee) to the respective Dean. The Dean will authenticate/approve the name and send it to the Controller of Examinations for book-keeping and to take the approval of the Vice-Chancellor.

The system of answer script evaluation of the School has to be approved by the Academic Council.

A8 Grading System

A8.1 Letter Grade and Grade Point: Letter Grade and corresponding Grade-Point for a course will be awarded from the roundup marks of individual courses as follows:

Numerical Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	C-	2.00
Less than 40%	F	0.00

A8.2 Calculation of Grades

A8.2.1 GPA: Grade Point Average (GPA) is the weighted average of the grade points obtained in all the courses completed by a student in a semester.

A8.2.2 CGPA: Cumulative Grade Point Average (CGPA) of major degree will be calculated by the weighted average of all courses of the previous semesters along with that of the current/present semester. For the calculation of the final CGPA of clearing graduates, if the third digit after the decimal point is nonzero then its previous, that is, the second digit will be incremented by one.

A8.2.3 F Grades: A student will be given an "F" grade if s/he fails or remains absent in the final examination of a registered course. If a student obtains an "F" grade, her/his grade will not be counted for GPA and s/he will have to repeat the course. An "F" grade will be in her/his record, and s/he will not be eligible for distinction, award, and scholarship of the university.

A9. Distinction

Candidates for this program will be awarded the degree with Distinction if her/his overall CGPA is 3.75 or above. However, a candidate/student will not be considered for Distinction and any kind of Awards if s/he has any one of the following:

(a) s/he is not a regular student,
(b) s/he has semester drop or incomplete courses in any semester,
(c) s/he has an "F" grade in any course,
(d) s/he has upgraded her/his GPA through improvement,
(e) s/he is addicted to drugs,
(f) disciplinary action(s) is taken against her/him.

A10. Examination Ethics:

All involved in the examination process must follow the provisions of ethical issues stated in Clause IV in the OGP.

A.11General Instruction

A11.1 Disable (only handicapped) and slow learning students will be allowed 5 (five) minutes extra per hour during the examination.

A11.2 Disable (blind/without hand only) students will be allowed to take support in writing during the examination. But the writer should be junior and unfamiliar with the course for which the examinee is hiring her/him.

A11.3 Application for result correction may be accepted if it is submitted/lodged within the next 3 (three) months since the publication of the result. Chairman of the concerned examination committee/ Head of the discipline and the Controller of Examinations will do the corrections as per rules.

A11.4 The result/ tabulation sheet for course improvement will be signed by the examination committee of the present semester of the examinee.

A12 Exam Hall structure:

A12.1 For final examination of theory courses the number of invigilators will be as in the following.

For each exam hall:

- For 1 – 25 examinees, 2 (two) invigilators will be assigned.
- For 26 – 40 examinees, 3 (three) invigilators will be assigned.
- After 40 examinees, 1 (one) invigilator will be increased for each 20 examinees.
- For each course, one chief invigilator will be assigned to conduct the examination.

A12.2 For Term Test of a theory course, the number of invigilators will be two(02) including the course teacher.

A13 For continuous assessment, course teacher will do the needful and no other invigilators are required.

A14. Academic Fee: To be decided by the Academic Council and the Syndicate.

B. Master's by Mixed Mode

B1 Eligibility

B1.1 Graduates with a Bachelor's degree in a relevant Discipline from SUST or any other university or equivalent foreign university, with a minimum CGPA of 3.00, are eligible to apply for the Master's by Mixed Mode program.

B1.2 A candidate holding a Master's by Coursework degree in a relevant Discipline from SUST is eligible for admission to the Master's by Mixed Mode program, provided s/he has achieved a minimum CGPA of 3.25 in his/her Master's by Coursework program.

B1.3 A candidate currently enrolled in a Master's by Coursework program at SUST, who has already completed 18 credits of coursework with a CGPA of 3.25 or higher, is eligible to apply for the conversion from his/her current program to this program. In such cases, the candidate will be granted a waiver for theory courses completed in the Master's by Coursework program.

B1.4 A candidate who has graduated under the course system and has achieved at least a second division/class in all previous examinations is eligible for admission to this program. In such cases, the candidate must provide evidence that this degree will enhance his/her professional career.

B1.5 A candidate with a Bachelor's degree in engineering from a university or institution other than SUST, who has completed 160 credits as his/her degree requirements with a minimum CGPA of 3.00, is eligible to apply for the Master's by Mixed Mode program.

B2 Admission:

B.2.1 The candidate applied for this program must submit the following documents: (i) application in the prescribed form, (ii) academic transcript, (iii) a research proposal, (iv) one reference letter, (v) consent letter from a potential Supervisor, and (vi) consent letter from the employer, wherever applicable.

B2.2 Candidates will be selected for admission based on the performance in a written and/or viva voce examination conducted by the Graduate Studies Committee (GSC). However, full-time university teachers will be exempted from the written examination.

B2.3 The GSC will assign a Supervisor and, if applicable, a Co-Supervisor for the dissertation work among the teachers in the same Discipline at SUST. However, the Co-Supervisor can be selected from other Disciplines of SUST or from home and abroad. Both the Supervisor and Co-Supervisor must meet the required qualification criteria outlined in clause B2.3.1

B2.3.1 Qualification of the Supervisor/Co-Supervisor

The Supervisor or Co-Supervisor must possess one of the following qualifications: a permanent faculty member at SUST with the rank of (i) a Professor (ii) an Associate Professor holding at least a Master's by Research degree; (iii) an Assistant Professor with a PhD and a minimum three years of teaching experience. If necessary, a permanent employee with a PhD degree from a university other than SUST or an accredited research institution, working in a position equivalent to that of an Associate Professor and above, can be assigned as a Co-Supervisor.

B2.4 After selecting the candidates for the program, the GSC will make a recommendation for admission along with a summary sheet and the following supportive documents: (i) tentative title of the dissertation; (ii) proposed supervisor and co-supervisor (if any); (iii) research proposal; (iv) academic records with CGPA; (v) an evaluation sheet for the qualification of the candidate; and (vi) statements regarding the qualification and consent of the supervisor and co-supervisor. The GSC will forward this recommendation to the Board of Advanced Studies (BAS) through the Dean of the School for subsequent approval by the Academic Council (AC).

B2.5 A SUST faculty member may be admitted to this program with prior approval from the University Authority.

B3 Registration

B3.1 Every admitted candidate must register with the registrar's office and pay the required fees for the program.

B3.2 A student enrolled in this program must register for a minimum of 8 (eight) credits and a maximum of 16 (sixteen) credits per semester.

B3.3 The candidature of the registered candidate will remain valid for a maximum of 6 (six) semesters.

B4 Academic Calendar

B4.1 Number of Semester

There will be two semesters in an academic year. The first semester of the year will start on 1st January and end on 30th June, the Second semester will begin on 1st July and end on 31st December. The roster of the final examination dates and other academic deadlines will be announced at the beginning of each semester.

B4.2 Duration of Semesters:

The duration of each semester will be as follows:

Classes	14 weeks
Recess before final Examination	2 weeks
Final Examination	4 weeks (Max.)
Semester Break for the Result Processing and Publication	2 weeks
Total	22 weeks

These 22 (Twenty-two) weeks may not be continuous in order to accommodate various holidays and the recess before the final examination.

B5 Course Pattern

The entire Master's by Mixed Mode program has covered through a set of theory courses and dissertation work. At the beginning of every academic session, a short description of courses will be published by the curriculum committee of each Discipline.

B6 Academic Regulations

The Master's Mixed Mode program is a combination of theory courses and dissertation work. In this mode, a student's overall assessment is dependent on his/her performance in both the instructional courses and the research component. The minimum duration and total credits for the degree will be the same for all Schools, as outlined below.

Table: Credit requirements and duration of Master's by Mixed Mode program

Program Type	Credit Requirement				Program Duration			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Total (Min.)	Semester (Min.)	Year (Min.)	Semester (Max.)	Year (Max.)
Master's by Mixed Mode	18	12	16	40	3.0	1.5	6.0	3.0

The course structure for this program will be designed by the GSC and approved by the relevant School.

B6.1 Duration: Minimum duration for the degree is 3 (three) semesters.

B6.2 Credit Requirement: To obtain the Master's degree by Mixed Mode, a student must complete a minimum of 40 (forty) credits through a combination of taught coursework and a dissertation.

B6.3 Course Requirement: Students enrolled in this program must complete a minimum of 18 credit hours of instructional coursework, complemented by a research component of 12–16 credits. The GSC may recommend required courses, but not more than 12 (twelve) credits, from the graduate and/or undergraduate levels from other Disciplines.

B6.4 Dissertation Requirement: To obtain the degree, a student must complete a dissertation of 12–18 credits, as assigned by the GSC as a mandatory degree requirement. Upon completing the entire research work, the student will prepare a dissertation as a comprehensive piece of work. It should be evaluated for its theoretical, scientific and methodological soundness using a prescribed rubric as outlined in Clause B6.4.1.

B6.4.1 Dissertation Evaluation

The use of a prescribed rubric is obligatory for ensuring consistent and unbiased assessment of Master's dissertation, thereby promoting the uniform appraisal of research excellence and academic rigor. The rubric comprises three parts: Part A and B for quantitative and qualitative assessment of the dissertation, and Part C for evaluating the quality of the presentation and responses during the oral examination. The overall evaluation of the dissertation shall encompass the combined scores derived from the quantitative assessment and the performance exhibited during the oral presentation and examination. Part B, the qualitative component, will serve as feedback from the examiners, which the student should address to enhance the overall quality of the dissertation. Finally, the Supervisor will ensure that the examiners' revisions are appropriately incorporated into the final version of the dissertation.

B6.5 Incomplete Courses: If a student has any incomplete course(s), s/he has to register that incomplete course(s) from preceding semesters before registering courses from current or successive semesters. If an incomplete course is not available or offered in the running semesters, the student shall take such course(s) when it is available or offered.

B6.6 Course Withdrawal: A student can withdraw from a course by a written application to the Controller of Examinations through the Head/Director of the Discipline/Institute two weeks before the examination start. The Controller of Examinations will send the revised registration list(s) to the Disciplines before the commencement of semester final examination. There will be no record in transcript if the course is withdrawn.

B6.7 Course Repetition: If a student has to repeat a failed or incomplete course and that course is not available/offered any more, the Discipline may allow him/her to take an equivalent course from the current curriculum. For clearing graduates, if any incomplete course is not available/offered in the running semester, the Discipline may suggest a suitable/equivalent course to complete the credit required for the degree.

B6.8 Special Semester: Students with any retake or re-retake course(s) may apply for a special semester to complete the total required courses, with a maximum limit of twelve (12) credits during that semester. A special semester will be offered for final semester students who have retake or re-retake courses. The examination will commence four (4) weeks after the publication of the result and will continue for a maximum of two (2) weeks. The marks for both attendance and continuous assessments will be carried over from the previous record.

B7 Examination

Under the semester-course system, students will undergo continuous evaluation. In theoretical classes, assessment methods include class participation, assignments, quizzes, mid-semester examinations, topic-based report writing/presentation, and a final examination at the end of the semester. Laboratory/sessional work will be evaluated through observation, viva-voce sessions, lab quizzes, written reports, and examination grades determined by the course instructor and examination committee.

B7.1 Examination Committee

B7.1.1 The Graduate Studies Committee (GSC) of the Discipline or Institute will form the examination committee as follows:

Chairman: A teacher not bellow the rank of Professor of the GSC, in absence of Professor of the Discipline, an Associate Professor/Head of the Discipline. Head of the GSC will be the Chairman of the terminal semesters.

Internal Members: 04 (four) teachers from the members of the GSC.

External Members: One teacher/expert (not below the rank of Professor or equivalent).

The respective Deans will ratify the list of the examinations committees and send it to the registrar for approval from the Academic Council (AC).

B7.1.2 The examination committee proposes the examination schedule, finalizes question papers, assists the Discipline in conducting the examination, preparing results, and addressing any issues that may arise regarding the examination procedure.

B7.2. Examination Dates and Routines

B7.2.1 The respective Disciplines will prepare the examination schedules, and the Heads of the Disciplines will notify them and distribute copies to other relevant Disciplines, as well as to the Office of the Controller of Examinations.

B7.3 Theory Courses

B7.3.1 Distribution of Marks: The marks of a given course will be as follows.

1.	Class Attendance	10%
2.	Class performance (Quizzes/MCQ/fill in the gap/report writing/ presentation/Assignments)	10%
3.	Mid-Semester Examinations	20%
4.	Final Examination (25% is the pass mark for the final examination)	60%

B7.3.2 Class attendance: The marks for class attendance will be as follows:

Attendance (Percentage)	≥ 95	90 – < 95	85 – < 90	80 – < 85	75 – < 80	70 – < 75	65 – < 70	60 – < 65	50 – < 60
Marks	10	9	8	7	6	5	4	3	0

A student will not be allowed to appear the final examination of a course if his or her class attendance in that course is less than 50%.

B7.4 Mid-Semester Examination: There should be at least two Mid-Semester examinations for every theory course. The course teacher may decide the marks distribution of the Mid-Semester examinations. The answer scripts must be shown to the students as it is essential to their learning process.

B7.5 Question Setting and Moderation

B7.5.1 The Examination Committee will propose two question setters for each course to the Dean for appointment, at least four weeks prior to the examination commencement date, and subsequently inform the Controller of Examinations. The Controller of Examinations will then provide the necessary documents to the appointed question setters and examiners. In the event

that a question setter or examiner declines the responsibility, they are required to return all documents, upon which the Examination Committee will propose an alternative question setter or examiner.

A7.5.2 The Chairman of the examination committee shall receive all the manuscripts of question papers. Should no manuscript be received within the stipulated timeframe, the committee will proceed to recommend an alternative question setter.

B7.5.3 After receiving all question paper manuscripts, the examination committee will proceed to moderate them. The committee is tasked with editing and printing the final question papers.

B7.6 Question Structure: Each Discipline must follow one unique question structure for final examinations. For 3.00 (three) or 4.00 (four) credits theory courses: (a) the written (final) examinations will be conducted for 60 marks, (b) there will be six questions for Double Examiner System (three questions in each part of the question paper for Single Examiner System), and the examinees will be asked to answer all of them, and (c) the examination time/duration will be 3 (three) hours. However, for 2.00 (two) credits theory courses: (a) the written (final) examination will be conducted for 60 marks, (b) there will be four questions for Double Examination System (two questions in each part of the question paper for Single Examination System), and the examinees will be asked to answer all of them, and (c) the examination time/duration will be 2 (two) hours. However, in the case of a Double Examiner System, a maximum of two questions with alternative questions will be given. In the case of a Single Examiner System, only one question with an alternative question will be provided in each part (Part A and Part B) of the question paper. The serial number, question number, assigned marks, related course learning outcome (CO), and Bloom's level of the questions must match in both the main question and the corresponding alternative question (in cases where a question consists of multiple sub-questions).

For instance:

Question Number	Question(s)	Consider these ARBITRARY		
		Assigned Marks	Related CO	Bloom's Level (BL)
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				
OR				
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				

OR

Question Number	Question(s)	Consider these ARBITRARY		
		Assigned Marks	Related CO	Bloom's Level (BL)
X(a)	…… …… ……	n_1	CO m_1	BL_{x1}
OR				
	…… …… ……	n_1	CO m_1	BL_{x1}
X(b)	…… …… ……	n_2	CO m_1	BL_{x2}
OR				
	…… …… ……	n_2	CO m_1	BL_{x2}
X(c)	…… …… ……	n_3	CO m_3	BL_{x5}
OR				
	…… …… ……	n_3	CO m_3	BL_{x5}
-				
-				

The GPA calculation will follow clause B7.3.1 during the result processing. Question setters are liable to set questions covering the entire curriculum of the course, and the examination committee shall have the liberty to investigate it and to do other necessary corrections during moderation. Moderated question paper must be printed and supplied to the examinees

B7.7 Final Examination

After the 16th week since the beginning of the semester, the final examination will be conducted as per the Postgraduate Examination Ordinance.

B7.7.1 Duration of the Final Examination

There will be a 3-hour final examination for every course of 3-4 (three-four) credits, and the courses less than 3 (three) credits will have a final examination for 2 (two) hours duration.

B7.7.1 Evaluation of answer scripts of final examination: The School of Disciplines may follow any one of the following answer script evaluation system.

(1) Single Examiner system, SES: The students will have two answer scripts to answer a separate set of questions during the final examination. Two examiners will grade the two answer scripts separately, and their given marks will be added together (examinee wise) for determining the Final Mark.

(2) Double Examiner system, DES: The students will have a single answer script to answer questions during the final examination. The answer scripts will be evaluated by two examiners separately. For determining the Final Mark: (1) If the difference of two marks of the examiners is less than 20%, then these two marks will be averaged, and (2) If the difference of two marks of the examiners is 20% or more, the corresponding/concerned answer scripts will be examined by a third examiner and then the closer (by smaller difference) otherwise higher two marks of the three examiners will be averaged. Furthermore, if the total marks of two examiners differ by 15% or more in the case of 50% or more answer scripts of a course, then the whole set of answer scripts will be examined by a third examiner.

The examination committee will propose the name for appointing the third examiner(s) (not any member of the examination committee) to the respective Dean. The Dean will authenticate/approve the name and send it to the Controller of Examinations for book-keeping and to take the approval of the Vice-Chancellor. The system of answer script evaluation of the School has to be approved by the Academic Council.

B7.8 Dissertation Submission and evaluation

B7.8.1 Dissertation title: The dissertation title for the Master's degree by Mixed Mode has to be approved by the BAS based on the recommendation of the GSC. However, changes to the initially approved dissertation title can be made within the first year of his/her enrollment.

B7.8.2 The proposal for any change in the initially approved dissertation title must be formally declared during the public seminar talk, as mentioned in Clause C6.4. Subsequently, the

changed dissertation title should be submitted to the BAS for approval through the GSC and the respective Dean.

B7.8.2. The GSC, in consultation with the Supervisor, will propose both the final dissertation title and the dissertation evaluators' panel, including alternative panel members, to the BAS through the Dean, either simultaneously or separately.

B7.8.3 Each student is mandated to submit three printed copies of his/her dissertation, adhering to the approved dissertation format, to the Chairman of the GSC.

B7.8.4 The student is obligated to assert that the conducted research work is his/her original contribution and has not been previously submitted elsewhere, except for publication purposes.

B7.8.5 The dissertation should manifest substantiated evidence of the student's proficient knowledge in the field of the undertaken research.

B8 Submission and Examination of Master's by Mixed Mode Work-Documents

B8.1 Master's by Mixed Mode work-documents package: The documentation attesting to the fulfillment of this program comprises of the subsequent components: (i) evidence of one participation in an international conference substantiated by relevant documents (conference proceedings, abstract books) if published; (ii) a comprehensive resume derived from seminar talks, encapsulating details such as total completed credits, aggregate seminar talks, conference presentations and the number of published or accepted journal article(s) if any; (iii) grade sheet(s) corresponding to completed coursework; and (iv) the dissertation paper itself, validated as a work characterized by theoretical, scientific, and methodological soundness.

B8.2 Supervisor's declaration: The Supervisor shall formally communicate in writing to the GSC that the student has fulfilled all prerequisites for the degree and has compiled the requisite Master's by Mixed Mode work-document package for assessment. Subsequently, the GSC will recommend to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS) to initiate the formal procedure for the evaluation of the Master by Mixed Mode work.

B8.3 Dissertation Evaluation

Dissertation of Master's by Mixed Mode program must be evaluated using a prescribed rubric as outlined in Clause B6.4.1. Two examination committees, namely the dissertation evaluation committee and the oral examination committee, will assess the dissertation work. The distribution of marks for both the dissertation evaluation and oral examination is as follows:

i) Supervisor : 30%
ii) Two (2) Examiners (Dissertation evaluators) : 40% (20% + 20%)
iii) Oral Examination Committee Members : 30%

B8.4 Formation of Dissertation Evaluation Committee

B8.4.1 The GSC, in collaboration with the Supervisor, will recommend to the Academic Council (AC) through the Dean and the Board of Advanced Studies (BAS), the constitution of a Dissertation Evaluation Committee (DEC) tasked with assessing the dissertation work requisite for the completion of the Master's degree by Mixed Mode.

B8.4.2 The Academic Council (AC), upon the recommendation of the GSC, will appoint a DEC for each dissertation, with the Supervisor as the Chairman. The committee shall be comprised of two members, with at least one member being external to SUST, referred to as the external member. The proposal must include alternative candidates for both committee members. External member invited to serve on the Dissertation Evaluation

Committee (DEC) must hold the rank of an Associate Professor or above with a PhD, and have a minimum of two (2) publications in Web of Science or Scopus-indexed journals.

B.8.4.3 Documents to be provided to the DEC members: The Controller of Examinations, in collaboration with the Supervisor, will provide the dissertation evaluators with (i) the comprehensive work-documents package detailed in Clause B8.1; (ii) Parts A and B of the prescribed rubric for quantitative and qualitative evaluation of the dissertation, as specified in Clause B6.4.1; and (iii) the appointment letter indicating the decision of the Academic Council.

B8.5 Formation of Oral Examination Committee

B8.5.1 The Academic Council, in line with the recommendations of the GSC, will appoint an Oral Examination Committee (OEC) composed of the following members: (i) the Chairman of the GSC as the Chair; (ii) Supervisor or Co-Supervisor (in the absence of the Supervisor); (iii) an external member of the DEC; and (iv) a member of the GSC nominated by the Dean in consultation with the Supervisor. All members nominated by the Dean must meet the qualification criteria outlined in (i) and (ii) of Clause B2.3.1.

B8.5.2 If a member of the OEC is unable to participate in the oral examination, the Vice-Chancellor will assign a replacement from the members of the GSC of the Discipline.

B.8.5.3 Documents to be provided to the OEC members: The Controller of Examinations, in collaboration with the Supervisor, will provide the dissertation evaluators with (i) the dissertation paper (printed/soft copy) mentioned in (iv) of Clause B8.1; (ii) Part C of the prescribed rubric for evaluating the quality of the presentation and responses during the oral examination, as specified in Clause B6.4.1; and (iii) the appointment letter indicating the decision of the Academic Council (AC).

B8.6 Evaluation report of the Dissertation Evaluation Committee (DEC) members

B8.6.1 Each member of the DEC is obliged to assess the Master's by Mixed Mode program dissertation both quantitatively and qualitatively, utilizing the prescribed rubric as mentioned in Clause B6.4.1. Subsequently, each member is required to prepare an individual and distinct report, encompassing (i) quantitative and qualitative evaluations of the dissertation (using the supplied rubric) and (ii) marks obtained, reflecting the overall assessment**.**

B8.6.2 In the dissertation evaluation report, each member of the DEC is mandated to explicitly state whether they recommend or do not recommend the conferral of the Master's degree by Mixed Mode. These recommendations should fall into one of the following categories: (i) recommended with no correction or minor correction; (ii) recommended with major correction and resubmission; and (iii) rejected.

B8.6.3 Every member of DEC shall dispatch two copies of the report, securely sealed in two separate envelopes to the Controller of Examinations. Concurrently, a hard copy or soft copy (in PDF) of the report must be sent to the Chairman of the DEC.

B8.6.4 The Supervisor's evaluation report must include (i) the student's expertise development in the field, covering theoretical and experimental/practical aspects, the student's contribution to the development of apparatus/method, manuscript and the dissertation paper preparation, etc.; and (ii) marks obtained, reflecting the overall assessment. The Supervisor will send two copies of his or her evaluation report, securely sealed in two separate envelopes to the Controller of Examinations.

B8.7 Disclosure of the report: Upon the Supervisor's request, the Chairman of the GSC will collect copies of the three evaluation reports from the Office of the Controller of the Examinations. The GSC Chairman will unveil the reports during a specifically convened

GSC meeting in presence of the Supervisor (or Co-Supervisor in the Supervisor's absence). All members must receive prior notification of this event. However, the disclosure of the reports requires the presence of at least more than half of the active GSC members present in Bangladesh.

B8.8 GSC's Response to the Recommendations of Evaluation Reports: Subsequent to the disclosure of the evaluation reports, the GSC will undertake one of the actions outlined in Clauses B8.8.1 – B.8.83, provided the recommendations are explicit, unequivocal, and unanimous.

B8.8.1 In cases where recommendations entail no correction or minor correction, the GSC will propose an oral examination committee following Clause B8.5.1, forwarding it to the Academic Council through the respective Dean and the BAS for approval.

B8.8.2 In cases where major corrections and resubmission are recommended, the GSC will instruct the student, through the Supervisor, to address the required corrections and resubmit the dissertation within a six-month period. Subsequent to the revision, the updated dissertation is to be submitted to the Controller of the Examinations through the GSC and made available to the initial members of the DEC for subsequent evaluation following Clause B8.4.3.

B8.8.3 In instances where the recommendations result in rejection, the Chair of the GSC will formally communicate the decision of rejection to the student, and recommend the Academic Council, through the Dean and the BAS, to annul the student's registration.

B8.8.4 In cases where unanimity is lacking in the recommendations, a committee comprising (i) the Chairman of the GSC as the Chair; (ii) a Professor from the respective School nominated by the Dean; and (iii) the Supervisor, will thoroughly examine the reports from the dissertation evaluators. Subsequently, the committee will submit a report, incorporating one of the recommendations, as outlined in Clauses B8.8.1–C.8.8.3, to the BAS through the GSC and the respective Dean for formal approval.

B9 Public Defense and Oral Examination

B9.1 Venue and date: Upon receiving unanimous positive opinions from the dissertation evaluators, the Chairman of the GSC, acting as the Chair of the OEC, will, in consultation with the Supervisor and OEC members, schedule a date and venue for the public defense and oral examination. The Chairman of the GSC is mandated to notify OEC members about the event.

B9.2 Publicity of the defense ceremony the collective responsibility of publicizing the defense rests with the GSC, the student, and the Supervisor/Co-Supervisors to garner maximum public attention.

Mandatory components include:

(i) invitation extended to the Dean and the BAS members.

(ii) display of posters on the facades of all academic buildings and the central library, posting on the notice board of relevant Disciplines, and invitations through the SUST Website/email in collaboration with the relevant authority (SUST Computer and Information Center).

Optional components encompass:

The Master's by Mixed Mode work will be made available to interested parties for a week preceding the final defense. Posters will indicate the location and time of the materials' accessibility. The Supervisor or Co-Supervisor, subject to approval from the Chairman of the GSC, will oversee the organization of this event.

B9.3 The Public Defense Ceremony: The GSC will organize the event. The Chairman of the GSC, as the Chair of the OEC, will preside over the ceremony. The Supervisor will briefly introduce the candidate (biography, works, quality, moral). Subsequently, the candidate will present his or her complete dissertation work. Following the presentation, an opportunity will be provided for questions and answers. At a designated moment, the Chairman of the OEC will officially declare the 'Closure of the Discussion'.

B9.4 Protocol of the Public defense: The Chairman of the GSC, in collaboration with the Supervisor or Co-Supervisor and the relevant Master's by Mixed Mode student(s), will formulate a protocol encompassing details about the participants (committee members, audience), questions and answers, and modifications made in accordance with the dissertation evaluators' reports. The protocol, along with the attendance sheet, must be signed by the Chairman of the OEC.

B9.5 Oral Examinations: After the culmination of the public defense ceremony, the OEC will proceed to conduct a closed-door oral examination of the candidate and subsequently determine the eligibility for conferring the degree.

B9.5.1 In the event of a favorable decision, members of the OEC will compile a comprehensive report, incorporating (i) a precise declaration in favor of conferring the Master's degree by Mixed Mode; and (ii) the average marks attained, indicating the overall assessment. Additionally, they will affix their signatures on designated pages of the dissertation under the heading 'Oral Examination Committee', along with their respective names, designations, and affiliations.

B9.5.2 The Chairman of the OEC will forward the compiled report, securely sealed in an official envelope, to the Academic Council through the BAS for the degree to be awarded.

B9.5.3 Archiving of the dissertation work: A hard copy of the final version of the dissertation, as forwarded by the Chairman of the OEC, will be archived in the university central library, while the corresponding digital version will be stored in the institutional repository. The archived copy will bear an official stamp delineating: Master's degree by Mixed Mode Conferred on ….., pursuant to Decision No. ….of the ….th Syndicate, ratified on ……..

B9.5.4 If the decision of the OEC is disapproving, the candidate may have the option to appear at another oral examination after a six-month interval, or the process may be stopped by the termination of the student's enrollment. It is imperative to note that no candidate is permitted to present the same dissertation at the oral examination more than twice.

B10. Grading System

B10.1 Letter Grade and Grade Point: Letter Grade and corresponding Grade-Point for a course will be awarded from the roundup marks of individual courses as follows:

Numerical Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	C-	2.00
Less than 40%	F	0.00

B10.2 Calculation of Grades

B10.2.1 GPA: Grade Point Average (GPA) is the weighted average of the grade points obtained in all the courses completed by a student in a semester.

B10.2.2 CGPA: Cumulative Grade Point Average (CGPA) of major degree will be calculated by the weighted average of all courses of the previous semesters along with that of the current/present semester. For the calculation of the final CGPA of clearing graduates, if the third digit after the decimal point is nonzero then its previous, that is, the second digit will be incremented by one.

B10.2.3 F Grades: A student will be given an "F" grade if s/he fails or remains absent in the final examination of a registered course. If a student obtains an "F" grade, her/his grade will not be counted for GPA and s/he will have to repeat the course. An "F" grade will be in her/his record, and s/he will not be eligible for distinction, award, and scholarship of the university.

B11. Distinction Candidates for this program will be awarded the degree with Distinction if her/his overall CGPA is 3.75 or above. However, a candidate/student will not be considered for Distinction and any kind of Awards if s/he has any one of the following:

(g) s/he is not a regular student,
(h) s/he has semester drop or incomplete courses in any semester,
(i) s/he has an "F" grade in any course,
(j) s/he has upgraded her/his GPA through improvement,
(k) s/he is addicted to drugs,
(l) disciplinary action(s) is taken against her/him.

B12. Certificate of Practical Skill: For extraordinary and remarkable contribution in establishing lab(s)/new lab set ups, instrument making, developing software/algorithm/apps/device/ technology/technique, designing research tools, etc., student (involved) will be awarded a certificate of excellence in practical skill based on the decisions of the Discipline by the respective dean.

B13. Examination Ethics

All involved in the examination process must follow the provisions of ethical issues stated in the Clause IV in the OGP.

B14. General Instruction

B14.1 Disable (only handicapped) and slow learning students will be allowed 5 (five) minutes extra per hour during the examination.

B14.2 Disable (blind/without hand only) students will be allowed to take support in writing during the examination. But the writer should be junior and unfamiliar with the course for which the examinee is hiring her/him.

B14.3 Application for result correction may be accepted if it is submitted/lodged within the next 3 (three) months since the publication of the result. Chairman of the concerned examination committee/ Head of the Discipline and the Controller of Examinations will do the corrections as per rules.

B14.4 The result/ tabulation sheet for course improvement will be signed by the examination committee of the present semester of the examinee.

B15. Exam Hall structure:

B15.1 For final examination of theory courses the number of invigilators will be as in the following.

For each exam hall:

- For 1 – 25 examinees, 2 (two) invigilators will be assigned.
- For 26 – 40 examinees, 3 (three) invigilators will be assigned.
- After 40 examinees, 1 (one) invigilator will be increased for each 20 examinees.
- For each course, one chief invigilator will be assigned to conduct the examination.

B15.2 For Term Test of a theory course, the number of invigilators will be two(02) including the course teacher.

B16 For continuous assessment, course teacher will do the needful and no other invigilators are required.

B17 Academic Fee: To be decided by the Academic Council and the Syndicate.

C. Master's by Research

C1 Eligibility

C1.1 Graduates with a Bachelor's degree in a relevant Discipline from SUST or any other university or equivalent foreign university, with a minimum CGPA of 3.00, are eligible to apply for the Master's by Research program.

C1.2 A candidate holding a Master's by Coursework (General) degree in a relevant Discipline from SUST is eligible for admission to the Master's by Research program, provided s/he has achieved a minimum CGPA of 3.25 in his or her Master's by Coursework program.

C1.3 A candidate currently enrolled in a Master's by Coursework program at SUST, who has already completed 18 credits of coursework with a CGPA of 3.25 or higher, is eligible to apply for the conversion from his/her current program to this program.

C1.4 A candidate who has graduated under the course system and has achieved at least a second division/class in all previous examinations is eligible for admission to this program. In such cases, the candidate must provide evidence that this degree will enhance his/her professional career.

C1.5 A candidate with a Bachelor's degree in engineering from a university or institution other than SUST, who has completed 160 credits as his/her degree requirements with a minimum CGPA of 3.00, is eligible to apply for the Master's by Research program.

C2 Admission:

C.2.1 The candidate applied for this program must submit the following documents: (i) application in the prescribed form, (ii) academic transcript, (iii) a research proposal, (iv) one reference letter, (v) consent letter from a potential Supervisor, and (vi) consent letter from the employer, wherever applicable.

C2.2 Candidates will be selected for admission based on the performance in a written and/or viva voce examination conducted by the Graduate Studies Committee (GSC). However, full-time university teachers will be exempted from the written examination.

C2.3 The GSC will assign a Supervisor and, if applicable, a Co-Supervisor for the dissertation work among the teachers in the same Discipline at SUST. However, the Co-Supervisor can be selected from other Disciplines of SUST or from home and abroad. Both the Supervisor and Co-Supervisor must meet the required qualification criteria outlined in clause C2.3.1

C2.3.1 Qualification of the Supervisor/Co-Supervisor

The Supervisor or Co-Supervisor must possess one of the following qualifications: a permanent faculty member at SUST with the rank of (i) a Professor (ii) an Associate Professor holding at least a Master's by Research degree; (iii) an Assistant Professor with a PhD and a minimum three years of teaching experience. If necessary, a permanent employee with a PhD degree from a university other than SUST or an accredited research institution, working in a position equivalent to that of an Associate Professor or Professor, can be assigned as a Co-Supervisor.

C2.4 After selecting the candidates for the program, the GSC will make a recommendation for admission along with a summary sheet and the following supportive documents: (i) tentative title of the dissertation; (ii) proposed supervisor and co-supervisor (if any); (iii) research proposal; (iv) academic records with CGPA; (v) an evaluation sheet for the qualification of the candidate; and (vi) statements regarding the qualification and consent of the supervisor and co-supervisor. The GSC will forward this recommendation to the Board of Advanced Studies (BAS) through the Dean of the School for subsequent approval by the Academic Council (AC).

C2.5 If necessary, the Graduate Studies Committee (GSC) may recommend non-credit courses at the bachelor's or master's levels to enhance the candidate's academic foundations for specific research.

C2.6 A change in the Supervisory team, either for the primary Supervisor or Co-Supervisor, may be initiated through a proposal put forth by the current Supervisor. The nominated replacement for either role must adhere to the specified qualification criteria detailed in clause C2.3.1. If the GSC considers the proposed change justified, the matter will be forwarded to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS) for required approval.

C3 Registration

C3.1 Every admitted candidate must register with the registrar's office and pay the required fees for the program.

C3.2 Date of registration and duration of the Candidature: Registration takes effect on the date approved by BAS and successively endorsed by AC. The duration of the registered Master's by research program will be counted from the date of registration.

C3.3 A student enrolled in this program must register for a minimum of 8 (eight) credits and a maximum of 16 (sixteen) credits per semester.

C3.4 The candidature of the registered candidate will remain valid for a maximum of 6 (six) semesters.

C4 Academic Calendar

C4.1 Number of Semester

There will be two semesters in an academic year. The first semester of the year will start on 1st January and end on 30th June, the Second semester will begin on 1st July and end on 31st December.

C5 Course Pattern

A Master's by Research program is primarily centered around the development of a dissertation, with the possibility of including some taught components.

C5.1 Non-credit course requirements

C5.1.1 Any taught components within the Master's by Research program are non-credit-bearing, meaning that the credits of these courses will not be added to the total credits if passed.

C5.1.2 If necessary, the GSC may recommend courses at the Bachelor's or Master's levels to enhance the candidate's academic foundations for specific research.

C5.1.3 Once courses are recommended by the GSC of the Discipline, the completion of those courses becomes mandatory to obtain the degree.

C6 Academic Regulations

The Master's by Research program is fundamentally research-based, and as such, coursework is not mandatory. The evaluation of the student is solely based on his/her dissertation work. The minimum duration and total credits for the degree will be the same for all Schools, as outlined below.

Table: Credit requirements and duration of Master's by Research program

Program Type	Credit Requirement				Program Duration			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Total (Min.)	Semester (Min.)	Year (Min.)	Semester (Max.)	Year (Max.)
Master's by Research	Non-credit (if offered)	48	-	**48**	4.0	2.0	6.0	3.0

The course structure for this program will be designed by the GSC and approved by the relevant School.

C6.1 Duration: Minimum duration for the degree is four (4) semesters.

C6.2 Credit Requirement: To obtain the Master's degree by Research, a student must complete a minimum of forty-eight (48) credit hours through research. One credit hour for research corresponds to at least two contact hours.

C6.3 Course Requirement: The GSC may recommend required courses, not exceeding twelve (12) credits, at the graduate and/or undergraduate levels from the same or other Disciplines.

C6.4 Seminar-talk on research progress: This constitutes an obligatory element of this program. At the end of the first year, the registered student is mandated to deliver a public seminar talk, organized by the Graduate Studies Committee (GSC), at the respective discipline or institute. The topic of talk must be aligned to the field of research. A protocol for the seminar must be meticulously maintained, encompassing essential details, such as: (i) the total number of GSC members within the Discipline and the percentage in attendance; (ii) the overall number of participants and their categorization (Professors, Associate Professors, Assistant Professors, Lecturers, PhD/Master students, undergraduate students, experts, and guests); (iii) the presentation's topic; date, time, and duration; as well as noteworthy questions and suggestions raised during the event. The seminar presentation should be accessible to all.

C6.5 Paper-presentation in conferences: The dissemination of the research work within the scholarly community and relevant stakeholders is an imperative facet of this program. The student is required to present his/her research work at a minimum of two international conferences. The evidence of participation and presentation, including conference proceedings and / or abstract books, must be submitted to the GSC and be incorporated into the respective semester progress report.

C6.6 Dissertation Requirement: To obtain the Master's degree by Research, a candidate must complete a dissertation of 48–60 credits, as assigned by the GSC as a degree requirement. Upon completing the entire research work, the candidate will prepare a dissertation as a comprehensive piece of work. It should be evaluated for its scientific and methodological soundness using a prescribed rubric as outlined in Clause C6.6.1.

C6.6.1 Dissertation Evaluation

The use of a prescribed rubric is obligatory for ensuring consistent and unbiased assessment of Master's dissertation, thereby promoting the uniform appraisal of research excellence and academic rigor. The rubric comprises three parts: Part A and B for quantitative and qualitative assessment of the dissertation, and Part C for evaluating the quality of the presentation and responses during the oral examination. The overall evaluation of the dissertation shall encompass the combined scores derived from the quantitative assessment and the performance exhibited during the oral presentation and examination. Part B, the qualitative component, will serve as feedback from the examiners, which the student should address to enhance the overall quality of the dissertation. Finally, the Supervisor will ensure that the examiners' revisions are appropriately incorporated into the final version of the dissertation.

C6.7 Semester Report: Every candidate is required to submit a progress report to the Graduate Studies Committee (GSC) through the Supervisor at the end of each semester. This report should encompass a succinct overview of the undertaken work during the semester, along with performances measured by: (i) total non-credit hours completed for coursework; (ii) completed credit hours for research; (iii) details of seminar talks delivered, including date and topic; (iv) paper(s) presented in conferences (conference name, date, venue, presentation type: oral or poster, title, copy of the abstract/proceeding) if available; (v) Journal article(s) if available; and (vi) progress report. Concurrently, the student will submit a cumulative semester progress report, consolidating integrated performance metrics represented by numerical values (total credits completed, total number of seminar talks, conference presentations and published articles, if any.

C6.8 Working place: The research work is supposed to be conducted at SUST. However, it can be carried out outside SUST, subject to consultation with the Supervisor and approved by the Graduate Studies Committee (GSC).

C7 Examinations:

C7.1 Course Examination: Students enrolled in this program are required to participate in the examination of recommended theory courses, where applicable, in accordance with the examination ordinance specific to the program level to which the courses are affiliated. The chairman of the corresponding examination committee will make a separate tabulation sheet for them and send it to the chairman of the GSC. However, the results of the assigned courses will be categorized as either pass or fail for this program as mentioned in Clause C5.1.

C7.2 Dissertation Submission and evaluation

C7.2.1 Dissertation title: The Dissertation title for the Master's degree by Research has to be approved by the BAS based on the recommendation of the GSC. However, changes to the initially approved dissertation title can be made within the first year of his/her enrollment.

C7.2.2 The proposal for any change in the initially approved dissertation title must be formally declared during the public seminar talk, as mentioned in Clause C6.4. Subsequently, the changed dissertation title should be sent to the BAS for approval through the GSC and the respective Dean.

C7.2.3. The GSC, in consultation with the Supervisor, will propose both the final dissertation title and the dissertation evaluation panel, including alternative panel members, to the BAS through the respective Dean, either simultaneously or separately.

C7.2.4 Each student is mandated to submit 3 (Three) printed copies of his/her dissertation, adhering to the approved dissertation format, to the Chairman of the GSC.

C7.2.5 The student is obligated to assert that the conducted research work is his/her original contribution and has not been previously submitted elsewhere, except for publication purposes.

C7.2.6 The dissertation should manifest substantiated evidence of the student's proficient knowledge in the field of the undertaken research.

C8 Master's by Research work-documents submission and Examination

C8.1 Master's by Research work-documents package: The documentation attesting to the fulfillment of the Master by Research program comprises of the subsequent components: (i) evidence of participation in an international conference substantiated by relevant documents (conference proceedings/abstract books); (ii) a comprehensive resume derived from seminar talks, encapsulating details such as total completed credits, aggregate seminar talks, cumulative conference presentations, and the number of published journal papers, if any; (iii) grade sheet(s) corresponding to completed coursework (if applicable); and (iv) three copies of dissertation paper itself, validated as a work characterized by theoretical, scientific, and methodological soundness.

C8.2 Supervisor's declaration: The Supervisor should submit the statement regarding the context and outcomes of the research in writing to the GSC that the student has fulfilled all prerequisites for the degree and has compiled the requisite program related work-document package for assessment. Subsequently, the Graduate Studies Committee (GSC) will recommend to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS) to initiate the formal procedure for the evaluation of the Master's by Research work.

C8.3 Dissertation Evaluation

Dissertation of Master's by Research must be evaluated using a prescribed rubric as outlined in Clause B6.6.1. Two examination committees, namely the dissertation evaluation committee and the oral examination committee, will assess the dissertation work. The distribution of marks for both the dissertation evaluation and oral examination is as follows:

iv) Supervisor : 30%
v) Two (2) Examiners (Dissertation evaluators) : 40% (20% + 20%)
vi) Oral Examination Committee Members : 30%

C8.4 Formation of Dissertation Evaluation Committee

C8.4.1 The GSC, in collaboration with the Supervisor, will recommend to the Academic Council (AC) through the respective Dean and the BAS, the constitution of a Dissertation Evaluation Committee (DEC) tasked with assessing the dissertation work required for the completion of the Master's degree by Research.

C8.4.2 The Academic Council (AC), upon the recommendation of the GSC, will appoint a DEC for each dissertation, with the Supervisor as the chairman. The committee shall be comprised of two members, with at least one member being external to SUST, referred to as the external member. The proposal must include alternative candidates for both committee members. External member invited to serve on the DEC must hold the rank of an Associate Professor or above with a PhD, and have a minimum of two (2) publications in Web of Science or Scopus-indexed journals.

C.8.4.3 Documents to be provided to the DEC members: The Controller of Examinations, in collaboration with the Supervisor, will provide the dissertation evaluators with (i) the comprehensive work-documents package detailed in Clause C8.1; (ii) Parts A and B of the prescribed rubric for quantitative and qualitative evaluation of the dissertation, as specified in Clause C6.6.1; and (iii) the appointment letter indicating the decision of the Academic Council.

C8.5 Formation of Oral Examination Committee

C8.5.1 The Academic Council, in line with the recommendations of the GSC, will appoint an Oral Examination Committee (OEC) composed of the following members: (i) the chairman of the GSC as the chair; (ii) Supervisor or Co-Supervisor (in the absence of the Supervisor); (iii) an external member of the DEC; and (iv) a member of the GSC nominated by the Dean in consultation with the Supervisor. All members nominated by the Dean must meet the qualification criteria outlined in (i) and (ii) of Clause C2.3.1.

C8.5.2 If a member of the OEC is unable to participate in the oral examination, the Vice-Chancellor will assign a replacement from the members of the GSC of the Discipline.

C.8.5.3 Documents to be provided to the OEC members: The Controller of Examinations, in collaboration with the Supervisor, will provide the dissertation evaluators with (i) the dissertation paper (printed/soft copy) mentioned in (iv) of Clause C8.1; (ii) Parts C of the prescribed rubric for evaluating the quality of the presentation and responses during the oral examination, as specified in Clause C6.6.1; and (iii) the appointment letter indicating the decision of the Academic Council (AC).

C8.6 Evaluation report of the DEC members

C8.6.1 Each member of the DEC is obliged to assess the Master's by Research program dissertation both quantitatively and qualitatively, utilizing the prescribed rubric as mentioned in Clause C6.6.1. Subsequently, each member is required to prepare an individual and distinct report, encompassing (i) quantitative and qualitative evaluations of the dissertation (using the supplied rubric) and (ii) marks obtained, reflecting the overall assessment**.**

C8.6.2 In the dissertation evaluation report, each member of the Dissertation Evaluation Committee (DEC) is mandated to explicitly state whether they recommend or do not recommend the conferral of the Master's degree by Research. These recommendations should fall into one of the following categories: (i) recommended with no correction or minor correction; (ii) recommended with major correction and resubmission; and (iii) rejected.

C8.6.3 Every member of DEC shall dispatch two copies of the report, securely sealed in two separate envelopes to the Controller of Examinations. Concurrently, a hard copy or soft copy (in PDF) of the report must be sent to the Chairman of the DEC.

C8.6.4 The Supervisor's evaluation report must include (i) the student's expertise development in the field, covering theoretical and experimental/practical aspects, the student's contribution to the development of apparatus/method, manuscript and the dissertation paper preparation, etc.; and (ii) marks obtained, reflecting the overall assessment. The Supervisor will send two copies of his or her evaluation report, securely sealed in two separate envelopes to the Controller of Examinations.

C8.7 Disclosure of the report: Upon the Supervisor's request, the chairman of the Graduate Studies Committee (GSC) will collect copies of the three evaluation reports from the Office of the Controller of the Examination. The GSC Chairman will unveil the reports during a specifically convened GSC meeting in presence of the Supervisor (or Co-Supervisor in the Supervisor's absence). All members must receive prior notification of this event. However, the disclosure of the reports requires the presence of at least more than half of the active GSC members present in Bangladesh.

C8.8 GSC's Response to the Recommendations of Evaluation Reports: Subsequent to the disclosure of the evaluation reports, the Graduate Studies Committee (GSC) will undertake one of the actions outlined in Clauses C8.8.1 – C.8.83, provided the recommendations are explicit, unequivocal, and unanimous.

C8.8.1 In cases where recommendations entail no correction or minor correction, the GSC will propose an oral examination committee following Clause C8.5.1, forwarding it to the Academic Council through the respective Dean and the BAS for approval.

C8.8.2 In cases where major corrections and resubmission are recommended, the Graduate Studies Committee (GSC) will instruct the student, through the Supervisor, to address the required corrections and resubmit the dissertation within a six-month period. Subsequent to the revision, the updated dissertation must be submitted to the Controller of the Examinations through the Graduate Studies Committee (GSC) and made available to the initial members of the Dissertation Evaluation Committee (DEC) for subsequent evaluation following Clause C8.4.3.

C8.8.3 In instances where the recommendations result in rejection, the chair of the Graduate Studies Committee (GSC) will formally communicate the decision of rejection to the student, and recommend the Academic Council (AC), through the Dean and the Board of Advanced Studies (BAS), to annul the student's registration.

C8.8.4 In cases where unanimity is lacking in the recommendations, a committee comprising (i) the Chairman of the Graduate Studies Committee (GSC) as a chair; (ii) a professor from the respective school nominated by the Dean; and (iii) the Supervisor, will thoroughly examine the reports from the dissertation evaluators. Subsequently, the committee will submit a report, incorporating one of the recommendations outlined in Clauses C8.8.1–C.8.8.3, to the BAS through the GSC and the respective Dean for formal approval.

C9 Public Defense and Oral Examination

C9.1 Venue and date: Upon receiving unanimous positive opinions from the dissertation evaluators, the Chairman of the GSC, acting as the chair of the OEC, will, in consultation with the Supervisor and OEC members, schedule a date and venue for the public defense and oral examination. The Chairman of the GSC is mandated to notify OEC members about the event.

C9.2 Publicity of the defense ceremony: The collective responsibility of publicizing the defense rests with the GSC, the student, and the Supervisor/Co-Supervisors to garner maximum public attention.

Mandatory components include:

(i) invitation extended to the Dean and the BAS members.

(ii) display of posters on the facades of all academic buildings and the central library, posting on the notice board of relevant disciplines, and invitations through the SUST Website/email in collaboration with the relevant authority (SUST Computer and Information Center).

Optional components encompass:

The Master's by Research work will be made available to interested parties for a week preceding the final

defense. Posters will indicate the location and time of the materials' accessibility. The Supervisor or Co

Supervisor, subject to approval from the Chairman of the GSC, will oversee the organization of this event.

C9.3 The Public Defense Ceremony: The GSC will organize the event. The chairman of the GSC, as the chair of the OEC, will preside over the ceremony. The Supervisor will briefly introduce the candidate of the Master's by Research program (biography, works, quality, moral). Subsequently, the candidate will present his or her complete dissertation work. Following the presentation, an opportunity will be provided for questions and answers. At a designated moment, the chairman of the OEC will officially declare the 'Closure of the Discussion'.

C9.4 Protocol of the Public defense

The chairman of the GSC, in collaboration with the Supervisor or Co-Supervisor and the relevant Master's by Research student(s), will formulate a protocol encompassing details about the participants (committee members, audience), questions and answers, and modifications made in accordance with the dissertation evaluators' reports. The protocol, along with the attendance sheet, must be signed by the chairman of the OEC.

C9.5 Oral Examinations: After the culmination of the public defense ceremony, the OEC will proceed to conduct a closed-door oral examination of the student and subsequently determine the eligibility for conferring the degree.

C9.5.1 In the event of a favorable decision, members of the OEC will compile a comprehensive report, incorporating (i) a precise declaration in favor of conferring the Master's degree by Research; and (ii) the average marks attained, indicating the overall assessment. Additionally, they will affix their signatures on designated pages of the dissertation under the heading 'Oral Examination Committee', along with their respective names, designations, and affiliations.

C9.5.2 The chairman of the OEC will forward the compiled report, securely sealed in an official envelope, to the Academic Council through the BAS for the degree to be awarded.

B9.5.3 Archiving of the dissertation work: A hard copy of the final version of the dissertation, as forwarded by the chairman of the OEC, will be archived in the university central library, while the corresponding digital version will be stored in the institutional repository. The archived copy will bear an official stamp delineating: Master's degree by Research Conferred on ….., pursuant to Decision No. ….of the ….th Syndicate, ratified on ……..

C9.5.4 If the decision of the OEC is disapproving, the candidate may have the option to appear at another oral examination after a six-month interval, or the process may be stopped by the termination of the student's enrollment. It is imperative to note that no candidate is permitted to present the same dissertation at the oral examination more than twice.

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C10 Award of the degree and archiving

C10.1 Recommendation for degree

At the convening of the Board of Advanced Studies (BAS) meeting, the designated representative of the Oral Examination Committee (OEC) will be called upon to respond to queries seeking clarification. If, during the proceedings, the Board of Advanced Studies (BAS) finds that the work aligns with the stipulated requirements and that procedural protocols have been duly maintained, it will propose the award of the degree for deliberation by the Academic Council (AC) and subsequent endorsement by the Syndicate.

C10.2 Archiving of the Dissertation Work

A hard copy of the final version of the dissertation, as forwarded by the chairman of the Oral Examination Committee (OEC), will be archived in the central university library, while the corresponding digital version will be stored in the institutional repository. The archived copy will bear an official stamp delineating: Master's by Research degree Conferred on ….., pursuant to Decision No. ….of the ….th Syndicate, ratified on ……..

C11. Grading System

C11.1 Letter Grade and Grade Point: Letter Grade and corresponding Grade-Point for a course will be awarded from the roundup marks of individual courses as follows:

Numerical Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	C-	2.00
Less than 40%	F	0.00

C11.2 Calculation of Grade

C11.2.1 If both the Dissertation Evaluation Committee (DEC) and Oral Examination Committee (OEC) provide favorable decisions, the grade point will be computed utilizing the marks assigned by the Supervisor and the assessments given by the members of the two examination committees—the Dissertation Evaluation Committee and the Oral Examination Committee—in accordance with the distribution of marks outlined in Clause 8.3.

C12. Distinction

Candidates for this program will be awarded the degree with Distinction if her/his overall CGPA is 3.75 or above. However, a candidate/student will not be considered for Distinction and any kind of Awards if s/he has any one of the following:

(m) s/he is not a regular student,
(n) s/he has semester drop or incomplete courses in any semester,
(o) s/he has an "F" grade in any course,
(p) s/he has upgraded her/his GPA through improvement,
(q) s/he is addicted to drugs,
(r) disciplinary action(s) is taken against her/him.

C13. Certificate of Practical Skill: For extraordinary and remarkable contribution in establishing lab(s)/new lab set ups, instrument making, developing software/algorithm/apps/device/ technology/technique, designing research tools, etc., student (involved) will be awarded a certificate of excellence in practical skill based on the decisions of the discipline by the respective Dean.

C14. Academic Fee: To be decided by the Academic Council and the Syndicate.

C15. Ethical Issues and Dispute resolution:

All involved in the examination process must follow the provisions of ethical issues stated in the Clause IV and V in the OGP.

D. Doctoral by Research Program

The Doctoral program available at Shahjalal University of Science and Technology is designated as the Doctor of Philosophy (PhD). The demands of PhD research require a significant commitment by candidates in terms of time and resources. The candidates are expected to be working full-time on their doctoral research. Part time candidature may also be permitted in some stages under some conditions.

D1. Eligibility:

D1.1 As a candidate with a Master's degree by Mixed Mode with CGPA 3.25 or with a Master's by Research degree is eligible to apply for a PhD program as a regular student.

D1.2 A candidate currently enrolled in a Master's by Research program at SUST is eligible to apply for the conversion from a Master's by Research to a PhD program, subject to the fulfillment of the following conditions: (i) the candidate must have authored at least two published articles in peer-reviewed journal(s) derived from his/her research work within the first two semesters, provided that s/he appears as the first or corresponding author, (ii) the supervisor must certify that the candidate possesses the potential to successfully complete the PhD program, and (iii) the Graduate Studies Committee (GSC) confirms that the progress achieved is solely attributable to the candidate. The proposal for this conversion requires approval from the Board of Advanced Studies (BAS) and subsequently from the Academic Council (AC). From the date of conversion at AC, the PhD candidature will be started. The title of the PhD dissertation along with a research proposal must be submitted to GSC.

D1.3 A candidate who has graduated in Masters (by research) under the course system (other than semester system) and is seeking admission to the PhD program must hold a minimum of a second division or class in all previous examinations. Additionally, the candidate is required to attain a score of at least 50% in his/her Master's (Research) examination.

D1.4 Candidates eligible for direct admission to the PhD program as regular students should fulfill any of the following criteria: (i) university or college teachers possessing a Master's by Mixed Mode or Master's by Research; (ii) university teachers with a minimum of three (3) years of teaching experience at the university level; (iii) college teachers (teaching in graduate programs) with a minimum of five (5) years of teaching experience at the college level; and (iv) researchers affiliated with recognized research organizations, provided they have a minimum of six (6) years of research experience being appointed as a research scholar or associate. It is pertinent to note that candidates falling under categories (ii) through (iv) are required to have at least two research articles published in a Web of Science or SCOPUS-indexed journal where they appear as the first or corresponding author.

D2 Admission

D2.1 A candidate possessing all required qualifications for admission to the PhD program is needed to submit an application to the Head of the Discipline or the Director of the Institute. The application must be accompanied by the following documents: (i) a completed application form; (ii) academic transcripts; (iii) a comprehensive research proposal; (iv) a reference letter; (v) a letter of consent from a potential Supervisor (as per the provision stated in clause D4.1); and (vi) a letter of consent from the employer, if applicable. In cases where the candidate does not propose a specific Supervisor, the Graduate Studies Committee (GSC) retains the authority to assign a Supervisor among the faculty members within the same Discipline or any other Discipline at SUST, relevant to the proposed topic.

D2.2 Candidates aspiring to enroll in the PhD program, possessing the qualifications outlined in Clauses D1.1–D1.3, shall undergo a selection process facilitated by the GSC. This process may involve written and/or viva voce examinations, wherein the GSC will assess and select the suitable candidates for admission. GSC may arrange a presentation for the candidate to clarify his/her research proposal.

D2.3 Following the selection of the candidate for the PhD program, the GSC will provide a recommendation supported by a summary sheet including documents (i) a provisional title for the dissertation; (ii) proposed Supervisor and Co-Supervisor, (if applicable) (iii) a research proposal endorsed by the GSC; (iv) academic records of the candidate; (v) an assessment sheet detailing the candidate's qualifications; (vi) statements confirming the qualifications and consent of the Supervisor and Co-Supervisor (if any) and (vii) evidence of accommodating the student in the Institution of the Co-Supervisor (external to SUST), where applicable.

D2.4 The Chairman of the GSC will then send all the documents mentioned in Clause D2.3 to the Board of Advanced Studies (BAS) through the respective Dean for subsequent approval by the Academic Council (AC).

D2.5 If deemed necessary, the GSC has the prerogative to suggest non-credit courses at the Bachelor's or Master's levels, aiming to fortify the candidate's academic foundations pertinent to his/her specific research endeavors.

D3 Registration

D3.1 Every candidate must register for the degree of Doctor of Philosophy (PhD) as a full-time student for the first year. By the end of the year the student needs to confirm his/her candidature defending his/her research work with satisfactory progress assessed by the GSC. After successful confirmation of the candidature, the candidate can continue his/her study with full time status or may apply for a part time status.

D3.1.1 After the confirmation of candidature, a PhD student i) who is in a full-time employment in a research supportive environment and expected to continue in the employment situation, and ii) who could not attend the university and participate in a full-time basis due to assignable causes may apply to register as a part-time student. The GSC will confirm the part-time studentship status with the approval of BAS and AC.

D3.1.2 Date of registration and duration of the Candidature: Registration takes effect on the date approved by BAS and successively endorsed by AC. The duration of the registered PhD program will be counted from the date of registration.

D3.2 A candidate enroll in the PhD program must register for a minimum of 8 (eight) credits and a maximum of 16 (sixteen) credits per semester.

D3.3 The registration for the PhD program will remain valid for a maximum of 12 (twelve) semesters.

D3.4 The period of candidature for this program will remain valid for a maximum of 6 (six) academic years.

D3.5 Review of registration:

D3.5.1 After confirmation of candidature in the first year or within the stipulated time-frame, a PhD student must submit the progress report endorsed by the main Supervisor to the GSC. Based on the progress evaluation, the GSC will make one of the following recommendations to BAS:

- **(i)** that the candidate's registration be confirmed
- **(ii)** that the candidate's registration be continued subject to specific conditions
- **(iii)** that the candidate's candidature be terminated.

D3.5.2 After receiving the recommendation from the GSC about the candidature of a PhD student, the BAS will take decision for approval. However, no decision to terminate the registration be made by the BAS unless the candidate has been notified in writing and given reasonable opportunity to response.

D4 Supervision:

As stated in D2.3, the BAS being proposed by GSC will appoint a qualified Supervisor and Co-supervisor

(if required) for each candidate for supervising his/her work throughout the program.

D4.1. ***Qualification of Supervisor***

The *Supervisor* must actively involve in research in the candidate's general field and hold one of the following qualifications: (i) a permanent faculty member at SUST with the rank of Professor with PhD degree or be appropriately qualified and experienced (ii) an Associate Professor with PhD and having a minimum of two (2) publications in Web of Science or Scopus indexed journals; and (iii) a Supernumerary, Emeritus, or Distinguished Professor with PhD degree within the relevant Discipline, contingent upon a clear declaration from the pertinent Graduate Studies Committee (GSC) affirming the Professor's acknowledged expertise in the chosen field of study for which the student seeks enrollment.

D4.2 ***Qualification of Co-supervisor***:

The *Co-Supervisor* must possess one of the following qualifications: (i) a permanent faculty member at SUST with the rank of Professor with PhD degree or be appropriately qualified and experienced (ii) an Associate Professor holding a PhD and having a minimum of two (2) publications in Web of Science or Scopus indexed journals; (iii) an Assistant Professor with a PhD and a minimum of three years of teaching experience, along with a minimum of two (2) publications in Web of Science or Scopus indexed journals; and (iv) if necessary, a permanent employee with a PhD degree from a university other than SUST or an accredited research institution, engaged in a position equivalent to that of an Associate Professor or above, possessing a laboratory/institutional unit, or obtaining permission to use the laboratory/institutional unit from higher authority, and having the capability to accommodate the SUST PhD student in that laboratory/institutional unit for research. Documentation confirming this capacity must be presented to the Graduate Studies Committee (GSC).

D5 Changes to the Conditions of Registration

During the progress of the PhD it may become necessary to change Supervisor/Co-supervisor or the Topic/Title. Generally, the changes require the approval of BAS after receiving a recommendation of the GSC made in consultation with the Supervisor.

D5.1 ***Changes/replacement of the Supervisor/ Co-supervisor(s)***:

A change in the supervisory team, either for the Supervisor or Co-Supervisor, may be initiated through a proposal put forth by the current Supervisor. The nominated replacement for either role must adhere to the specified qualification criteria detailed in clauses D4.1 and D4.2. If the Graduate Studies Committee (GSC) considers the proposed change justified, the matter will be forwarded to the Academic Council (AC) through the respective Dean and the BAS for approval. It is noted that the recommendation should always be accompanied by detailed reasons in support of any change.

D5.2*Changes of the Topic/Title of Dissertation:*

If there is a necessity to change the topic of PhD research previously approved by the AC for a candidate, the required change must be recommended by the GSC through Dean and be approved by the BAS and the AC and this need to be done by the first year or by the

confirmation of candidature within stipulated time-frame. In case of changing Title or correcting the Title, the changes must be done by following the earlier stated procedure.

D6 Academic Calendar: Number of Semester

There will be two semesters in an academic year. Generally, the first semester of the year will start on 1st January and end on 30th June, the Second semester will begin on 1st July and end on 31st December. The PhD candidate who needs to carry non-credit courses assigned by GSC should follow the academic calendar prescribed for the Master's by Research program.

D7 Course requirement and accomplishment

A PhD program is primarily centered around the development of a dissertation, with the possibility of including some taught courses assigned by the GSC. The course structure for this program will be designed by the Graduate Studies Committee (GSC) of a Discipline and approved by the relevant School.

D7.1 Non-credit course requirements

D7.1.1 Any taught components within the PhD program are non-credit-bearing, meaning that the credits of these courses will not be added to the total credits, if passed.

D7.1.2 If necessary, the Graduate Studies Committee (GSC) may recommend courses at the Bachelor's or Master's levels to enhance the candidate's academic foundations pertinent to their specific research endeavors.

D7.1.3 Once courses are recommended by the Graduate Studies Committee (GSC) of the Discipline, the completion of those courses becomes mandatory to obtain the degree.

D8 Academic Regulations

The PhD program is fundamentally research-based, and as such, coursework is not mandatory. The evaluation of the student is solely based on their dissertation work. The minimum duration and total credits for the degree will be the same for all Schools, as outlined below.

Table: Credit requirements and duration of Doctoral Program

Program Type	Credit Requirement				Program Duration			
	Coursework (Min.)	Dissertation (Min.)	Dissertation (Max.)	Total (Min.)	Semester (Min.)	Year (Min.)	Semester (Max.)	Year (Max.)
PhD	Non-credit (if offered)	72	-	**72**	6.0	3.0	12	6.0

D8.1 Credit Requirement: To obtain the PhD degree, a student must complete a minimum of seventy-two (72) credit hours through research. One credit hour for research corresponds to at least two contact hours per week.

D8.2 Course Requirement: The Graduate Studies Committee (GSC) may recommend required courses, not exceeding twelve (12) credits equivalent, at the graduate and/or undergraduate levels from the same or other Disciplines. As stated earlier, these credits cannot be added to the minimum requirement for the degree.

D8.3 Seminar-talk on research progress: This constitutes an obligatory element of this program. At the end of the first year, the registered student is mandated to deliver a public seminar talk, organized by the Graduate Studies Committee (GSC), at the respective Discipline or Institute. The topic of talk must be aligned to the field of research. A protocol for the seminar must be meticulously maintained, encompassing essential details such as: (i) the total number of GSC members within the Discipline and the percentage in attendance; (ii) the overall number of participants and their categorization (Professors, Associate Professors, Assistant Professors, Lecturers, PhD/Master students, undergraduate students, experts, and guests); (iii) the presentation's topic; date, time, and duration; as well as noteworthy questions and suggestions raised during the event. The seminar presentation should be accessible to all.

D8.4 Paper-presentation in conferences: The dissemination of the research work within the scholarly community and relevant stakeholders is an imperative facet of the PhD program. The PhD student is required to present his/her research work at a minimum of two international conferences. The evidence of participation and presentation, including conference proceedings and / or abstract books, must be submitted to the GSC and be incorporated into the respective semester progress report.

D8.5 Research article Requirement: The student is required to have a minimum of two (2) articles published or accepted in peer-reviewed journals deriving from his/her PhD research, with the stipulation that at least one of these publications should be indexed in the Web of Science or Scopus. The candidate's authorship must be either as the first author or second to the Supervisor exclusively. Furthermore, a patent linked to the dissertation work, wherein the student holds a minimum ownership stake of 15%, will be considered equivalent to one article.

D8.6 Dissertation Requirement: To obtain the PhD degree, a student must complete a dissertation of 72–84 credits, as assigned by the Graduate Studies Committee (GSC) as a mandatory degree requirement. Upon completing the entire research work, the student should prepare a dissertation as a comprehensive piece of work. It should be evaluated for its scientific and methodological soundness using a prescribed guideline in the Clauses D8.6.1.

D8.6.1 Dissertation Evaluation

The use of a set guidelines is obligatory for ensuring consistent and unbiased assessment of PhD dissertation, thereby promoting the uniform appraisal of research excellence and academic rigor. Examiners are required to make their judgment on the basis of (i) originality (newness and novelty) of the work (ii) contribution of the research to the existing literature of relevant field (iii) well formulated structure of dissertation (including problem statement, research objectives, materials and methods, scientific analysis, format) and (iv) volume of the works and its scientific accomplishment aligned to a PhD work. Structured assessment form approved by AC will be sent to the examiners for benchmarking for evaluation.

D8.7 Semester Report: Every candidate is required to submit a progress report to the Graduate Studies Committee (GSC) through the Supervisor at the end of each semester. This report should encompass a succinct overview of the undertaken work during the semester, along with performances measured by: (i) total non-credit hours completed for coursework; (ii) completed credit hours for research; (iii) details of seminar talks delivered, including date and topic; (iv) paper(s) presented in conferences (conference name, date, venue, presentation type: oral or poster, title, copy of the abstract/proceeding) if available; (v) Journal article(s) if available; and (vi) progress report. Concurrently, the student will submit a cumulative semester progress report, consolidating integrated performance metrics represented by numerical values (total credits completed, total number of seminar talks, conference presentations and published articles, if any.

D8.8 Semester report analysis: The GSC will systematically assess the semester report during a convened meeting and evaluates the progress of research work and send the summarized report to BAS through Dean for further approval. In the event that two (2) successive research reports are adjudged unsatisfactory, the candidate may be called upon to furnish an explanation. Concurrently, the GSC, in collaboration with the Supervisor, may suggest improvement measures and await the submission of the subsequent two (2) consecutive reports. However, should there be four (4) consecutive reports assessed as unsatisfactory, the GSC may recommend to the Academic Council, through the respective Dean and the BAS, the termination of student's registration for PhD program.

D9 Working place: The research work is supposed to be carried out at SUST. However, it can be carried out outside SUST, subject to consultation with the Supervisor and approved by the Graduate Studies Committee (GSC).

D10 Examinations

D10.1 Course Examination: Students enrolled in the PhD program are required to participate in the examination of recommended theory courses, where applicable, in accordance with the examination ordinance specific to the program level to which the courses are affiliated. The Chairman of the corresponding examination committee will make a separate tabulation sheet for them and send it to the Chairman of the Graduate Studies Committee (GSC). However, the results of the assigned courses will be categorized as either pass or fail for this program as mentioned in Clause D5.1.

D10.2 Dissertation Submission

Each candidate is mandated to submit three printed copies of his/her dissertation to the GSC for evaluation. The Chairman of GSC will send the copies through Dean to the Controller of Examination Office for taking further measures for evaluation. It is noted that the plagiarism check of the submitted dissertation must be done by the relevant committee composed by the Dean (as Chair), Head of the Discipline and the Supervisor. The consolidated report duly signed by the committee member need to be attached with the dissertation copies to be evaluated.

D10.2.1 Dissertation Title: The dissertation title for the PhD degree has to be approved by the Board of Advanced Studies (BAS) based on the recommendation of the Graduate Studies Committee (GSC) Followed by the provision stated in clause D5.2, the title can be changed. Without formally approved Title, a dissertation will not be forwarded for evaluation.

D10.2.2 The GSC, in consultation with the Supervisor, will propose the dissertation evaluation panel, including alternative panel members, to the BAS through the respective Dean, either simultaneously or separately.

D10.2.3 The student is obligated to assert that the conducted research work is his/her original contribution and has not been previously submitted elsewhere, except for publication purposes.

D10.2.4 The dissertation should manifest substantiated evidence of the student's proficient knowledge in the field of the undertaken research.

D10.2.5 One month prior to the expected date of submission, candidate should notify the GSC in writing of his/her intention to submit.

D11 PhD Work-document submission with dissertation

D11.1 PhD Work-document package: The documentation attesting to the fulfillment of the PhD program comprises of the subsequent components: (i) three (3) copies of dissertation paper itself, validated as a work characterized by theoretical, scientific, and methodological soundness (ii) two published or accepted articles, as outlined in the Clause D6.6; (iii) evidence of participation in two international conferences substantiated by relevant documents (iv) a comprehensive resume derived from seminar talks, encapsulating details such as total completed credits, aggregate seminar talks, cumulative conference presentations, and the number of published journal papers; (v) grade sheet(s) corresponding to completed coursework, if applicable; and (v) plagiarism check report set by the guidelines of the AC.

D11.2 Supervisor's declaration: The Supervisor should submit the statement regarding the context and outcomes of the research in writing to the GSC that the student has fulfilled all prerequisites for the degree and has compiled the requisite PhD work-document package for assessment. Subsequently, the Graduate Studies Committee (GSC) will recommend to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS) to initiate the formal procedure for the evaluation of the PhD work.

D12 Dissertation Evaluation

Dissertation of PhD must be evaluated using a set guideline. Two examination committees, namely the Dissertation Evaluation Committee (DEC) and the Oral Examination Committee (OEC), will assess the dissertation work successively.

D12.1 Dissertation Evaluation Committee (DEC)

The DEC will be composed of three members: Supervisor as the Chairman and two External Members (External to SUST; referred as External Examiners hereafter), with a stipulation that at least one member is affiliated with a reputed university or institution outside the country.

D12.1.1 *Appointment of External Examiners*: The GSC, in collaboration with the Supervisor, will recommend the names of members to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS). The proposal for the committee must include alternative candidates for all external members. The Academic Council (AC), upon the recommendation of the Graduate Studies Committee (GSC), will appoint a DEC for each PhD dissertation approved by BAS.

D12.1.2 External member invited to serve on DEC must hold the rank of Professor with a PhD, and have a minimum of five (5) publications in Web of Science or Scopus-indexed journals, with at least three (3) of them as the first or corresponding author.

D.12.1.3 Documents to be provided to the DEC members: The Controller of Examinations, in collaboration with the Supervisor, will furnish the dissertation evaluators with (i) the comprehensive work-documents package detailed in Clause D11.1; (ii) Set Evaluation Form specified in D8.6.1; and (iii) the appointment letter indicating the decision of the Academic Council (AC).

D12.1.4 Every member of the Dissertation Evaluation Committee (DEC) shall dispatch two copies of the report, securely sealed in two separate envelopes to the Controller of Examinations. Concurrently, a hard copy or soft copy (in PDF) of the report must be sent to the Chairman of the Dissertation Evaluation Committee (DEC). DEC will submit all the evaluation reports to the Chairman of GSC for further step.

D12.1.5 If a report has not been received within two months, the Controller of Examination will send a reminder to the examiner and advise him/her that unless the report is received within the next (third) month, the appointment as examiner will be lapsed. If the report is not received within the stipulated time-frame, the BAS may appoint replacement examiner following the procedure stated in the clause D12.1.1.

D12.2 Oral Examination Committee (OEC)

D12.2.1 The Academic Council (AC), in line with the recommendations of the Graduate Studies Committee (GSC), will appoint an Oral Examination Committee (OEC) composed of the following members: (i) the Chairman of the Graduate Studies Committee (GSC) as the Chair; (ii) Supervisor or Co-Supervisor (in the absence of the Supervisor); (iii) any one of the external members of the Dissertation Evaluation Committee (DEC); (iv) a member of the Graduate Studies Committee (GSC) nominated by the respective Dean in consultation with the Supervisor. The member nominated by the Dean must meet the qualification criteria outlined in (i) and (ii) of Clause D4.1. If the Chairman of GSC himself/herself is a candidate for PhD The Chair of OEC will be the Dean of respective School.

D12.2.2 If a member of the Oral Examination Committee is unable to participate in the oral examination, the Vice-Chancellor will assign a replacement from the members of the Graduate Studies Committee (GSC).

D.12.2.3 Documents to be provided to the OEC members: The Controller of Examinations, in collaboration with the Supervisor, will furnish the dissertation evaluators with (i) the comprehensive work-documents package detailed in Clause D11.1; (ii) Set Evaluation Form specified in Clause D8.6.1; and (iii) the appointment letter indicating the decision of the Academic Council (AC).

D12.3. Evaluation report of the DEC members

D12.3.1 Each member of the Dissertation Evaluation Committee (DEC) is obliged to assess the PhD dissertation utilizing the prescribed format as mentioned in Clause D8.6.1. Subsequently, each member is required to prepare an individual and distinct report, encompassing evaluations of the dissertation (using the supplied guidelines in individual parameters) and reflecting the overall assessment**.**

D12.3.2 In the dissertation evaluation report, each member of the Dissertation Evaluation Committee (DEC) is mandated to explicitly state whether they recommend or do not recommend the conferral of the PhD degree. These recommendations should fall into one of the following categories: (i) recommended with no correction and suggested to proceed for oral examination for awarding the degree subject to satisfactory performance at that oral examination; (ii) recommended with minor correction and suggested to proceed for oral examination for awarding the degree subject to satisfactory performance at that oral examination and completion of corrections suggested; (iii) recommended for major revisions and resubmission and suggested not to proceed for oral examination without the evaluation of revised and resubmitted dissertation within stipulated time-frame; and (iv) rejection.

D12.3.3 The Supervisor's evaluation report must include (i) the student's expertise development in the field, covering theoretical and experimental/practical aspects, the student's contribution to the development of apparatus/method, manuscript and the dissertation paper preparation, etc.; and (ii) marks obtained, reflecting the overall assessment. The Supervisor will send two copies of his or her evaluation report, securely sealed in two separate envelopes provided, to the controller of examinations and one copy to the GSC.

D12.4 GSC's Response to the Recommendations of Evaluation Reports:

D12.4.1Disclosure of the report: The GSC Chairman will unveil the reports during a specifically convened GSC meeting in presence of the Supervisor (or Co-Supervisor in the Supervisor's absence). All members must receive prior notification of this event. However, the disclosure of the reports requires the presence of at least more than half of the active GSC members present in Bangladesh.

D12.4.2 Measures of GSC after disclosure of reports: Subsequent to the disclosure of the evaluation reports, the Graduate Studies Committee (GSC) will undertake one of the actions outlined in Clauses D12.4.2.1 – D12.4.2.4, provided the recommendations are explicit, unequivocal, and unanimous.

D12.4.2.1 In cases where recommendations entail no correction or minor correction, the Graduate Studies Committee (GSC) will propose an oral examination committee in adherence to Clause D12.2.1, forwarding it to the Academic Council (AC) through the respective Dean and the Board of Advanced Studies (BAS) for approval.

D12.4.2.2 In cases where major corrections and resubmission are recommended, the Graduate Studies Committee (GSC) will instruct the student, through the Supervisor, to address the required corrections and resubmit the dissertation within a six-month period. Subsequent to the revision, the updated dissertation must be submitted to the Controller of the Examinations through the Graduate Studies Committee (GSC) and made available to the initial members of the Dissertation Evaluation Committee (DEC) for subsequent evaluation. In case of the unavailability of the previously constituted examiners, newly formatted DEC will accomplish the Dissertation evaluation in place of earlier committee.

D12.4.2.3 In instances where the recommendations result in rejection, the chair of the Graduate Studies Committee (GSC) will formally communicate the decision of rejection to the student through the Supervisor, and recommend the Academic Council (AC), through the Dean and the Board of Advanced Studies (BAS), to annul the student's registration.

D12.4.2.4 In cases where unanimity lacks in the recommendations, a committee comprising (i) the Chairman of the Graduate Studies Committee (GSC) as a chair; (ii) a Professor from the respective School nominated by the Dean; and (iii) the Supervisor, will thoroughly examine the reports from the dissertation examiners. Subsequently, the committee will submit a report, incorporating one of the recommendations outlined in Clauses D8.8.2 and D.8.8.3, to the Board of Advanced Studies (BAS) through the Graduate Studies Committee (GSC) and the respective Dean for formal approval.

D12.5 Public Defense and Oral Examination

D12.5.1 Venue and Date: Upon receiving unanimous positive opinions from the dissertation evaluators, the Chairman of the Graduate Studies Committee (GSC), acting as the Chair of the Oral Examination Committee (OEC), will, in consultation with the Supervisor and OEC members, schedule a date and venue for the public defense and oral examination. The Chairman of the Graduate Studies Committee (GSC) is mandated to notify the OEC members about the event.

D12.5.2 Publicity of the Defense Ceremony: The collective responsibility of publicizing the defense rests with the Graduate Studies Committee (GSC), the PhD student, and the Supervisor or Co-Supervisor to garner maximum public attention.

Mandatory components include:

(i) invitation extended to the respective Dean and the BAS members.

(ii) display of posters on the facades of all academic buildings and the central library, posting on the notice board of relevant disciplines, and invitations through the SUST Website/email in collaboration with the relevant authority (SUST Computer and Information Center).

Optional components encompass:

Invitations extended to distinguished individuals in the research field pertinent to the dissertation, members of relevant professional societies, and Associated non-

governmental organizations (NGOs). The Supervisor or Co-Supervisor, subject to approval from the Chairman of the GSC, will oversee the organization of this event.

D12.5.3 The Public Defense Ceremony: The Graduate Studies Committee (GSC) will organize the event. The Chair of the Oral Examination Committee (OEC), will preside over the ceremony. The Supervisor will briefly introduce the candidate of the PhD program (biography, works, quality, moral). Subsequently, the candidate will present his or her complete dissertation work. Following the presentation, an opportunity will be provided for questions and answers. At a designated moment, the Chairman of the Oral Examination Committee (OEC) will officially declare the 'Closure of the Discussion'.

D12.5.4 Protocol of the Public defense

The Chairman of the Oral Examination Committee (OEC), in collaboration with the Supervisor or Co-Supervisor and the relevant PhD student(s), will formulate a protocol encompassing details about the participants (committee members, audience), questions and answers, and modifications made in accordance with the dissertation evaluators' reports. The protocol, along with the attendance sheet, must be signed by the Chairman of the Oral Examination Committee (OEC).

D12.5.5 Oral Examinations: After the culmination of the public defense ceremony, the Oral Examination Committee (OEC) will proceed to conduct a closed-door oral examination of the candidate and subsequently determine the eligibility for conferring the degree.

D12.5.5.1 In the event of a favorable decision, members of the Oral Examination Committee (OEC) will compile a comprehensive report, incorporating (i) a precise declaration in favor of conferring the PhD degree; and (ii) the average marks attained, indicating the overall assessment. Additionally, they will affix their signatures on designated pages of the dissertation under the heading 'Oral Examination Committee', along with their respective names, designations, and affiliations.

D12.5.5.2 If the decision of the Oral Examination Committee (OEC) is unfavorable to awarding degree, the candidate may have the option to appear at another oral examination after a six-month interval, or the process may be stopped by the termination of the student's enrollment. It is imperative to note that no candidate is permitted to present the same dissertation at the oral examination more than twice.

D13 Award of the degree and archiving

D13.1 Recommendation for degree:

The final report of OEC will be presented at the convening of the Board of Advanced Studies (BAS) meeting. The Board of Advanced Studies (BAS) finds that the work aligns with the stipulated requirements and that procedural protocols have been duly maintained, it will propose the award of the degree for deliberation by the Academic Council (AC) and subsequent endorsement by the Syndicate.

D13.2 Archiving of the Dissertation Work

A hard copy of the final version of the dissertation, as forwarded by the Chairman of the Oral Examination Committee (OEC), will be archived in the university central library, while the corresponding digital version will be stored in the institutional repository. The archived copy will bear an official stamp delineating: PhD degree Conferred on ….., pursuant to Decision No. ….of the ….th Syndicate, ratified on ……..

D14 Academic Fee: To be decided by the Academic Council and the Syndicate.

D15 Ethical Issues and Dispute Resolution

All involved in supervision and examination of PhD program must follow the provisions stated in the Clause IV and V of OGP.

Outcome Based Education (OBE)

Curriculum

Department of Geography and Environment

Shahjalal University of Science and Technology Sylhet-3114, Bangladesh

Curriculum for Graduate and Postgraduate Program
Session: 2024-25

Part A

1. Title of the Academic Program: Master's by Coursework, Master's by Mixed Mode, Master's by Research, and Doctoral by Research

2. Name of the University: Shahjalal University of Science and Technology

3. Vision of the University: To be a leading university of excellence in Science and Technology with a strong national commitment and significant international impact.

4. Mission of the University:

SUST M1: To advance learning and knowledge through teaching and research in science and technology.

SUST M2: To serve as a center for knowledge creation, technological innovation and transfer among academia, industry, and society.

SUST M3: To assist in transferring Bangladesh into a country with sustainable economic growth and equitable social development.

5. Name of the Program Offering Entity: Department of Geography and Environment

6. Vision of the Program Offering Entity: This department yearns to become a center of excellence in education and research to produce world class scholars, researchers and graduates that will lead the wider arena of Geography and Environment for building the sustainable physical and human environment.

7. Mission of the Program Offering Entity:

The missions of the Department of Geography and Environment are:

GEE M1: To enrich its students with academic experiences of the highest quality instructions and mentoring.

GEE M2: To conduct creative disciplinary and integrative research to lead the sustainable development of human and natural environment that benefits our national and global community by facing natural and human environmental challenges in the ever-changing world.

GEE M3: To promote leading capabilities with creativity, disciplinary knowledge, and effective teamwork.

GEE M4: To achieve personal academics, successful professionals, and effective researchers for time-demanding and technology-centered geo-world by use of modern technology in secondary and tertiary level, independent thought, collegial exchange of ideas and high ethical standards.

8. Objectives of the Program Offering Entity:

The objectives of Department of Geography and Environment are to:

- ✓ Acquiring knowledge in the wider arena of Geography and Environment.
- ✓ Mastering different types of tools and techniques used in higher education and research in traditional and emerging areas of Geography and Environment.
- ✓ Equipping students with the technical knowledge and practical skills required to work as an academic and professional geographer.
- ✓ Producing new knowledge through scientific research that have practical values.
- ✓ Building capacity in identifying and solving the problems in the relevant of Geography and Environment.
- ✓ Enhancing the ability of critical thinking and innovative skills.
- ✓ Improving documentation, presentation, and communication skills.
- ✓ Providing the highest quality professionals with strong morality and ethical values as well as committed to fulfill their social accountability.
- ✓ Motivating for higher studies and research and facilitating all programs that improve the skills of faculty members, students, and staffs.
- ✓ Increasing leading capabilities with ensuring effective teamwork.
- ✓ Applying knowledge for the welfare of the nation and the world.

9. Name of the Degree: Master's by Coursework, Master's by Mixed Mode, Master's by Research, and Doctoral by Research in Geography and Environment

10. Description of the Program:

The courses for Master's by Coursework in GEE are spread over two semesters – the first semester offers 18 credit courses, and second semester offers 22 credit courses. The courses for Master's by Mixed Mode in GEE are spread over three semesters with 18 credit courses in semester one, 12 credit courses in semester two, and 12 credit research courses in semester three. A student must complete 40 credits for the Master's by Coursework degree and 42 credits for the Master's by Mixed Mode degree.

11. Graduate Attributes:

Code	The Graduates of the department will:	Domain
GA 1	possess extensive knowledge in their field of expertise in geography and the environment, particularly in the areas of physical geography and human geography.	PO 1 PO 2 PO 6
GA 2	be capable of continuing their own self-directed learning and be able to think critically and creatively.	PO 5 PO 9
GA 3	possess the capacity for evaluation across a wide range of fields.	PO 7 PO 8
GA 4	obtain a high level of proficiency in communication, problem-solving, research or project-related activities, and writing.	PO 3 PO 8
GA 5	be able to start and carry out positive change in their professions, workplaces, and communities.	PO 5 PO 9
GA 6	possess a strong sense of morality and intellectual integrity.	PO 4

11. Program Educational Objectives (PEOs)

Students should be well-versed in the subjects after successfully completing the Master of Science in Geography and Environment program. However, as part of the process of graduating in that particular topic, students go through a system that is intended to prepare them with the knowledge they need to succeed in the real world. The educational goals of the program, which center on the graduates' contributions to society, are as follows:

PEO 1. Acquiring knowledge in the wider arena of Geography and Environment.

PEO 2. Mastering different types of tools and techniques used in higher education and research in traditional and emerging areas of Geography and Environment.

PEO 3. Equipping students with the technical knowledge and practical skills required to work as an academic and professional geographer.

PEO 4. Producing new knowledge through scientific research that have practical values.

PEO 5. Building capacity in identifying and solving the problems in the relevant of Geography and Environment.

PEO 6. Enhancing the ability of critical thinking and innovative skills.

PEO 7. Improving documentation, presentation, and communication skills.

PEO 8. Providing the highest quality professionals with strong morality and ethical values as well as committed to fulfill their social accountability.

PEO 9. Motivating for higher studies and research and facilitating all programs that improve the skills of faculty members, students, and staff.

PEO 10. Increasing leading capabilities with ensuring effective teamwork.

PEO 11. Applying knowledge for the welfare of the nation and the world.

13. Program Learning Outcomes (POs):

We emphasize foundational, social, intellectual, and personal skill development when designing the complete Master of Science in Geography and Environment curriculum. The following list of programs learning outcomes follows these areas of learning:

A. Fundamental Skill	
PO 1	Students will learn the fundamentals and core concepts of physical geography.
PO 2	The basics and fundamentals of human geography will be learned by the student.
PO 3	Students will gain proficiency with the lab instruments and computational software.
B. Social Skill	
PO 4	Students will be taught on matters of academic honesty, morality, and ethics.
PO 5	Students will learn how to communicate their ideas and thoughts clearly.
C. Thinking skill	
PO 6	In order to recognize and address issues in many fields of geography, students will be able to use the laws and principles of geography.
PO 7	With the necessary theoretical knowledge and skills, students will be adept at carrying out experiments, gathering and analyzing data to draw logical conclusions on their own or in teams, and conveying the scientific findings.
D. Personal Skill	
PO 8	The abilities of project management, collaboration, leadership, and communication will be taught to the students.
PO 9	Students will show reflection in their personal and professional development.

14. Mapping Mission of the University with PEOs:

PEOs	SUST M1	SUST M2	SUST M3
PEO 1	✓	✓	✓
PEO 2		✓	

PEO 3		✓	
PEO 4	✓		✓
PEO 5	✓	✓	✓
PEO 6	✓	✓	
PEO 7	✓	✓	
PEO 8	✓		✓
PEO 9		✓	
PEO 10	✓	✓	✓
PEO 11			✓

15. Mapping POs with the PEOs:

POs/ PEOs	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5	PEO 6	PEO 7	PEO 8	PEO 9	PEO 10	PEO 11
PO 1	✓										✓
PO 2	✓										✓
PO 3		✓	✓								✓
PO 4								✓			
PO 5		✓				✓	✓				
PO 6				✓							
PO 7				✓	✓	✓			✓		
PO 8			✓		✓	✓	✓			✓	
PO 9			✓	✓	✓			✓	✓	✓	

16. Mapping Courses with the POs:

Course/ POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
GEE 0314 5111	✓					✓			
GEE 0532 5113	✓				✓				
GEE 0532 5115						✓			
SPS 0314 5117					✓				
SPS 0314 5119							✓		
GEE 0532 5121						✓			
GEE 0532 5123				✓					
SPS 0314 5101		✓							
GEE 0314 5211								✓	
GEE 0532 5213					✓				
GEE 0532 5215					✓				
GEE 0532 5217	✓								
GEE 0314 5219			✓						
GEE 0314 5212									✓
SPS 0532 5201		✓							
SPS 0532 5112	✓			✓					
GEE 0314 5210							✓		
GEE 0532 5332			✓				✓		

Part B

Structure of the Curriculum:

The curriculum for the Graduate Program in Geography and Environment covers the requisite courses for the following degrees:

1. Master's by Coursework
2. Master's by Mixed Mode
3. Master's by Research
4. Doctoral by Research

1. Master's by Coursework:

The duration of Master's by Coursework in GEE is 1 year and are spreader over 2 semesters. The first semester offers 18 credit courses, and second semester offers 22 credits. A student must complete 40 credits for the Master's by Coursework degree. For admission the candidate must have completion of B.Sc. (Honours) in Geography and Environment related discipline. Total class duration in a semester is 14 weeks, recess before final examination is 2 weeks, final examination 4 weeks, and semester break for the result processing and publication is 2 weeks. Maximum academic years of completion is 2 years and are spreader over 4 semesters.

2. Master's by Mixed Mode:

The duration of Master's by Mixed Mode in GEE is 1.5 year and are spreader over 3 semesters. The first semester offers 18 credit courses, second semester offers 12 credits, and 12 credit research courses in semester three. A student must complete 42 credits for the Master's by Mixed Mode degree. Total class duration in a semester is 14 weeks, recess before final examination is 2 weeks, final examination 4 weeks, and semester break for the result processing and publication is 2 weeks. Maximum academic years of completion is 3 years and are spreader over 6 semesters.

Category of Courses:

Course Category	Course Type	Course Code	Course Title	Credit	Total credit
Core/ Optional Courses	Theory	GEE 0314 5111	Migration and Refugee Management	3.0	24
		GEE 0532 5113	Regional Planning and Development	3.0	
		GEE 0532 5115	Resource Management	3.0	
		GEE 0314 5117	Biodiversity and Conservation	3.0	
		GEE 0532 5121	Haor Ecology and its Resources	3.0	
		GEE 0532 5123	Paleogeography and Paleoenvironment	3.0	
		GEE 0314 5211	Urban Environmental Management	3.0	
		GEE 0532 5213	Coastal Geography and Environment	3.0	

		GEE 0532 5215	Climate Change, Government Policy, and Action Strategy	3.0	
		GEE 0314 5219	Geography of Tourism	3.0	
	Viva	GEE 0314 5210	Viva-voce	2.0	2.0
	Project	GEE 0314 5212	Project on Bangladesh	5.0	5.0
	Thesis	GEE 0532 5332	Thesis	12.0	12.0
General Education (GED) Courses	Theory	SPS 0314 5119	Natural Hazards and Disaster Management	3.0	6
		SPS 0532 5217	Environment, Population and Sustainable Development in Bangladesh	3.0	
	Lab	SPS 0314 5101	Advanced Research Methodology in Geography and Environment (Lab)	3.0	9
		SPS 0532 5112	Application of Unmanned Aerial Vehicle (UAV-DRONE) - Lab	3.0	
		SPS 0532 5201	Advanced Techniques in Geography and Environment (Lab)	3.0	

Semester wise distribution of courses:

GEE courses are categorized for three semesters are as follows:

First Semester:

Theory (Offer 4 Courses out of 7, where SPS 0314 5119 is mandatory) + Lab (2)

Course No.	Course Title	Hours/Week		Credits
		Theory	Lab	
GEE 0314 5111	Migration and Refugee Management	3	0	3.0
GEE 0532 5113	Regional Planning and Development	3	0	3.0
GEE 0532 5115	Resource Management	3	0	3.0
GEE 0314 5117	Biodiversity and Conservation	3	0	3.0
SPS 0314 5119	Natural Hazards and Disaster Management	3	0	3.0
GEE 0532 5121	Haor Ecology and its Resources	3	0	3.0
GEE 0532 5123	Paleogeography and Paleoenvironment	3	0	3.0
SPS 0314 5101	Advanced Research Methodology in Geography and Environment (Lab)	0	6	3.0
SPS 0532 5112	Application of Unmanned Aerial Vehicle (UAV-DRONE) - Lab	0	6	3.0
Total		12	12	18.0

Second Semester:

Master's by Coursework: Offer 4 Courses out of 5, where SPS 0532 5217 is mandatory; Project on Bangladesh (GEE 0314 5212) is also Compulsory.
Master's by Mixed Mode: Offer 3 Courses out of 5, where SPS 0532 5217 is mandatory SPS 0314 5201 (Lab) is compulsory for both Master's by Coursework and Master's by Mixed Mode. GEE 0314 5210 is compulsory only for Master's by Coursework.

Course No.	Course Title	Hours/Week		Credits
		Theory	Lab	
GEE 0314 5211	Urban Environmental Management	3	0	3.0
GEE 0532 5213	Coastal Geography and Environment	3	0	3.0
GEE 0532 5215	Climate Change, Government Policy, and Action Strategy	3	0	3.0
SPS 0532 5217	Environment, Population and Sustainable Development in Bangladesh	3	0	3.0
GEE 0314 5219	Geography of Tourism	3	0	3.0
GEE 0314 5212	Project on Bangladesh	0	10	5.0
SPS 0532 5201	Advanced Techniques in Geography and Environment (Lab)	0	6	3.0
GEE 0314 5210	Viva-voce			2.0
Total		12	*	**

* Master's by Coursework = 16 and Master's by Mixed Mode = 6
** Master's by Coursework = 22 and Master's by Mixed Mode = 12

Third Semester:

Course No.	Course Title	Hours/Week		Credits
		Theory	Lab	
GEE 0532 5332	Thesis	0	24	12.0
Total		0	24	12.0

Description of all courses including the following information for each course:

Course Profile

Course No: GEE 0314 5111	Credit: 3.0	Year: MS	Semester: First
Course Title: Migration and Refugee Management		Course Status: Theory	

Rationale of the Course:

Today, tens of millions of people are refugees, raising fundamental challenges for governments around the world. Throughout history, the rate of migration and refugees has been increasing and for this reason the demand and necessity of studying this subject is also increasing. The main purpose of this subject is to understand the nature of both internal and international forced migration in contexts of conflict, repression, security, natural disasters, environmental change, poverty, asylum, and policymaking.

Course Objectives:

The objectives of this course are –

1. To analyze the migration process, conditions, and policy of migration.
2. To evaluate the theoretical aspects of refugee protection and forced migration, whilst developing expertise through a choice of elective modules.
3. To discuss the previous and present trend of world migration and its consequences.

Course Contents:

Migration: concept and definition, scope of migration studies, classification, typologies, and selectivity of migration.

Data and Statistics: sources of data, nature of migration data and migration estimation procedure.

Theoretical Aspects of Migration Studies: Ravenstein's Law. Lee's hypothesis and Stouffer's intervening opportunity model. Mabugunj system approach and Zelinisky's mobility Hypotheses.

Internal Migration: determinants, types, causes and consequences.

International Migration: types, causes and consequences, selecting migration and overseas migration from Bangladesh.

Migration Policies: definitions, aims, objectives, historical background, migration policies in developed and developing countries, gender, and poverty issues in migration.

Population Redistribution: internal and international redistribution of population, refugee, and labor migration. Problems of urbanization. Internal displacement problems.

Environmental migration and Refugee Problems: mitigation, adaptation, and management.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Explain the complex and varied nature of migration and refugee studies

CO 2: Apply the theoretical knowledge for addressing migration issues.

CO 3: Justify migration policies that have emerged from the international community's for managing forced migration.

CO 4: Measure the knowledge of migration studies for dealing effectively its challenges and assisting refugees with proper management.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3		2						
CO 2						3	3		
CO 3				3	3				
CO 4						3		2	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓		✓	
CO 2	✓	✓		✓	✓		✓	
CO 3	✓	✓		✓	✓		✓	
CO 4	✓	✓		✓	✓		✓	
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. The Age of Migration (2nd Edition)-International Population Movements in the Modern World- Stephen
2. Castles, The Guilford Press, (2003)
3. The Refugees (1st Edition)-Viet Thanh Nguyen; Grove Press; (2017)
4. The Good Immigrant (1st Edition)- Nikesh Shukla; Unbound; (2016)
5. Governing Refugees (1st Edition)-Kirsten Mc Connachie; Routledge; (2014)
6. Survival Migration (1st Edition)-Alexander Betts; Cornell university; (2013)
7. Refugee and Migration Flows (1st Edition)- Bimal Ghosh; Palgrave Macmillan; (2018)

Course No: GEE 0532 5113	Credit: 3.0	Year: MS	Semester: First
Course Title: Regional Planning and Development		Course Status: Theory	

Rationale of the Course:

This course examines regional planning in advanced economies and the relationship between regional planning and more conventional land use planning. The course considers the origin and development of regional planning as a discipline, as well as its contemporary applications. Regional planning has a long history within advanced economies and over recent decades has been advanced as a key strategy for ensuring the economic competitiveness of major urban centers. The need for regional planning has also been boosted by the increasing connectedness of regions, both locally and across territorial borders. This course will also examine Sustainable regional planning, regional regeneration processes, Transport systems, regional planning and global connectivity, The processes of regional planning, Consultation processes, planning tools.

Course Objectives:

The objectives of this course are –

1. To teach regional planning in advanced economies and the relationship between regional planning and more conventional land use planning.
2. To clarify the origin and development of regional planning as a discipline, as well as its contemporary applications.
3. The course will examine: Sustainable regional planning, regeneration processes, Transport systems, regional planning and connectivity, processes of regional planning.

Course Contents:

The Conceptual Basis of Regional Planning: Concept of region, planning and regional planning, Regionalization and the Administrative Regions, Nature and scope of regional planning, types, component and factors of region and regional planning.

Methods and Techniques of Regionalization: Mapping technique, Ranking method, Subjective and Objective Weighting technique, Other techniques.
Regional Analysis: Inter Regional Analysis, The Regional Framework, Regional Accounts.
Intra-Regional Analysis: The Location of Industry, Weber L Smith, Spatial Structure of Regions (i.e., Central Place Theory), The Growth Pole Theory
Regional Transport Network Analysis: Degree of connectivity, Alpha, Beta, Gama indices, Degree of development (Pi Index), Detour Index, Degree of circuitry,
Preparation of composite index to measure transport Development.
Regional Planning in Practice: Regional Planning in U.K., USA, Russia, France, Japan, and Singapore.
Regional Planning in Bangladesh.

Course Learning Outcomes (COs):
After the successful completion of the course, students will be able to –
CO 1: Describe region and regional planning with highlighting the importance of studying regional planning in the development context.
CO 2: Apply different mapping and weighting techniques in the delineation of region.
CO 3: Evaluate inter regional analysis in the context of regional framework and regional accounts.
CO 4: Demonstrate the techniques and nature of regional planning principles for proper regional development in the context of sustainable development goals strategy.
CO 5: Illustrate the adopted planning of different regions for a proper and even regional development.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	3					3		
CO 2									
CO 3	2				3				
CO 4							3		
CO 5									
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓			
CO 2	✓	✓	✓	✓	✓			
CO 3	✓	✓	✓	✓	✓			
CO 4	✓	✓	✓	✓	✓			
CO 5	✓	✓	✓	✓	✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. Regional Planning and Development by R.C. Chandna
2. An Introduction to Development and Regional Planning by Jayasri Ray Chaudhuri
3. Regional Development and Planning: International Perspectives by A.R. Kuklinski
4. Weber, Alfred. 1929. (translated by Carl J. Friedrich from Weber's 1909 book). Theory of the Location of Industries. Chicago: The University of Chicago Press
5. Numerical experiments with central place theory and spatial interaction modelling- Openshaw S, Veneris Y, (2003), Environment and Planning A 35(8) 1389–1403
6. Growth poles and growth centers in regional planning--a review- David Derwent - Environment and Planning, vol. 1 (1969), pp. 5-32.

Course No: GEE 0532 5115	**Credits: 2.0**	**Year: MS**	**Semester: First**
Course Title: Resource Management		**Course Status: Theory**	

Rationale of the Course:
Sustainability is one of the most significant shifts in thinking and action in the environmental and resource management arenas. Resource Management emphasizes theoretical and sustainable solutions from a social, economic, and environmental perspective. In this course, students will learn ecological principles, policies, and practices required for a sustainable future within four main themes that focus on natural resources management and conservation.
Course Objectives:
The objectives of this course are –
1. To explain to students about resource allocation and elaborate them about resource ecosystem.
2. To compare the relationship between population and resources.
3. To elaborate resource Conservation strategies and techniques.
4. To acquire knowledge on resource appraisal, forecasting and monitoring.
5. To describe conservation strategies with reference to Bangladesh.

Course Contents:
Fundamentals of Resource and its Management: Definition and concepts, scope, and approaches. The evolution of the field of resource management. Resource allocation.
Resource Classification: Resource ecosystem; basic terms; Marine resources, natural resources; renewable and nonrenewable resources. Nature of resources. Resource Appraisal, Forecasting and Monitoring: Methods and techniques.
Population-Resource Nexus: Concepts of sustainability, carrying capacity, perception, attitude, and adjustment in resource management.
Resource Conservation: Meaning; strategies and techniques, important resources, and their conservation strategies with reference to Bangladesh.
Resource Planning and Management: Concept and approaches. The planning cycle; Models in planning. Perspectives on Future Resources: salient trends; social order; institutional reforms; policy making; international order and co-operation.

Course Learning Outcomes (COs):
After the successful completion of the course, students will be able to –
CO 1: Describe the concept of resource and its management (scope, approaches, evolution and allocation).
CO 2: Demonstrate the different methods and techniques of resource monitoring and forecasting.
CO 3: Distinguish the relationship between resource and development.
CO 4: Evaluate strategies and techniques of resource conservation with respect to Bangladesh.
CO 5: Construct resource planning and management in the context of Bangladesh.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2									
CO 3									
CO 4									
CO 5								1	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓						
CO 2	✓	✓					✓	
CO 3	✓							
CO 4	✓				✓			
CO 5	✓	✓			✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓			✓		✓	✓	✓
CO 2	✓			✓		✓	✓	✓
CO 3		✓	✓			✓	✓	✓
CO 4				✓	✓	✓	✓	✓
CO 5				✓	✓	✓	✓	✓

Books Recommended:

1. Environment and economy: Property rights and public policy. - Bromley, D. W. Blackwell Pub (June 1, 1991)
2. Mathematical programming for natural resource management. - Dykstra, D. P. McGraw-Hill (January 1, 1984).
3. Command and control and the pathology of natural resource management- Holling, C. S., & Meffe, G. K. (October 31, 2003).
4. Human resource management: rhetoric's and realities (Management, work and organizations) (2004th Edition) - Legge, K. (1995).
5. Strategy and human resource management (4th Edition) - Boxall, P., & Purcell, J. (2003).

Course No: GEE 0314 5117	Credit: 3.0	Year: MS	Semester: First
Course Title: Biodiversity and Conservation		Course Status: Theory	

Rationale of the Course:

Biodiversity and its conservation are postgraduate courses that provide students with essential knowledge, skills, and experience in conservation biology and in the management and sustainable use of natural resources. It provides a cutting-edge practical approach to the ecological principles and methodologies that are fundamental to biodiversity management and the conservation of species and habitats. It will provide in-depth knowledge for those looking to further their career in various aspects of biodiversity and its conservation. It would produce those who can communicate and address the problems related to conservation projects. This course is suitable to make the professional aware of the social, political, and economic issues relevant to achieving the goal.

Course Objectives:

The objectives of this course are –

1. Understand biodiversity dimensions and the scope of biodiversity science, including genetic, species, ecological, landscape, and urban biodiversity.
2. Evaluate the values of biodiversity, such as instrumental, intrinsic, ethical, aesthetic, and intellectual, and recognize its role in addressing demands and climate change.
3. Analyze conservation strategies, including techniques like protected areas, germplasm conservation, and seed banks, and comprehend the significance of species, genetic, and ecosystem diversity in conservation efforts.
4. Identify and address threats to biodiversity, such as habitat destruction, invasive species, pollution, and overexploitation, while examining species extinction processes, current and future extinction rates, and the IUCN threatened categories.

Course Contents:

Biodiversity: Concept and definition, Scope and Constraints of Biodiversity Science, Composition and Scales of Biodiversity: Genetic Diversity, Species/Organismal Diversity, Ecological/Ecosystem Diversity, Landscape/Pattern Diversity, Agro biodiversity, Bicultural Diversity and Urban Biodiversity

Values of Biodiversity: Instrumental/Utilitarian value and their categories, Direct use value; Indirect/ Non-consumptive use value, Introduction to Ecological Economics; Monetizing the value of Biodiversity; Intrinsic Value; Ethical and aesthetic values, Anthropocentrism, Biocentrism, Egocentrism and Religions; Intellectual Value; Deep Ecology.

Global Biodiversity: Components of biodiversity; Richness of life on the earth; Measures of diversity; A framework for managing biodiversity; Defining priorities for conservation and sustainable use; Protecting and restoring ecosystems, species, populations, and genetic diversity; Legal measures for sustainable use and protection of biodiversity; Building capacity for biodiversity management, Biodiversity prospecting.

Techniques and Methods of Biodiversity Conservation: management categories for conservation: Protected areas of Bangladesh. Germplasm conservation and seed banks: Uses of genetic information in conservation, Ex-situ and in-situ conservation, Species Diversity and Conservation, Genetic Biodiversity and Conservation, Ecosystem Diversity and Conservation. Forest and wildlife resources of Bangladesh: as a resource base and their conservation.

Wildlife Resources of Bangladesh and their Conservation: (a) Wildlife management in Bangladesh (b) Wildlife management principles: Ecological basis, hunting refuges, predator control, artificial stocking, Carrying capacity, habitat improvement, interspersion, territories, diseases (c) List of extinct wildlife of Bangladesh.

Threats to Biodiversity: Habitat Destruction, Fragmentation, Transformation, Degradation and Loss: Causes, Patterns and consequences on the Biodiversity of Major Land and Aquatic Systems Invasive Species: their introduction pathways, biological impacts of invasive species on terrestrial and aquatic systems Pollution: Impacts of Pesticide pollution, Water pollution and Air Pollution on biodiversity Overexploitation: Impacts of Exploitation on Target and Non-target Terrestrial and Aquatic species and Ecosystems,

Extinction: Types of Extinctions, processes responsible for Species Extinction, Current and Future Extinction Rates, IUCN Threatened Categories.

Importance of Conservation: In response to expanding anthropogenic demands, in response to global climate changes, Multidimensional aspects of conservation biology.

Biogeographic Classification Conservation Challenges in the Twenty First Century: Urbanization; Creating knowledge society, Conflict management and decision making, Management of introduced species.

Sustainable Living in the Biosphere: Biodiversity under protection; International geosphere biosphere program (IGBP); World Conservation strategy; IBP and MAB Programs.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Explain the concept of biodiversity and its various dimension- genetics, species, ecological, landscape and urban biodiversity.
CO 2: Evaluate the values of biodiversity- direct use value and indirect use value.
CO 3: Apply the knowledge of conservation strategies and techniques.
CO 4: Investigate the threats of biodiversity-habitat destruction, invasive species and over exploitation.
CO 5: Prescribe the current and future rates of extinction – IUCN threatened categories.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	2					3		
CO 2									
CO 3	3				2				
CO 4							3		
CO 5									
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓			
CO 2	✓	✓	✓	✓	✓			
CO 3	✓	✓	✓	✓	✓			
CO 4	✓	✓	✓	✓	✓			
CO 5	✓	✓	✓	✓	✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. Zoogeography: the geographical distribution of animals- DARLINGTON, J. Jr.(1957)
2. Biogeography: An Ecological Perspective – P. Denseveau, Roland Press.
3. Plant and Animal Geography – M.I. Newbigin, Mehtuen & amp
4. Biogeography – H. Robinson, Macdonald and Evans, London and Playmouth.
5. Animal Geography – George.

Course No: GEE 0314 5119	**Credit: 3.0**	**Year: MS**	**Semester: First**
Course Title: Natural Hazards and Disaster Management			**Course Status: Theory**

Rationale of the Course:

Natural hazards and the processes associated with the physical environment are some of the most prominent challenges that we face globally. This course will develop students' abilities to analyze and predict future events, as well as manage and mitigate their effects to support communities when they need it most.

Course Objectives:

The objectives of this course are –

1. To understand the concepts about hazards and disaster.
2. To explain the importance of disaster management.
3. To familiarize yourself with the procedure of disaster risk reduction.
4. To discern the disaster management approaches of Bangladesh.

Course Contents:

Natural Hazards: Definition and Concept of Hazard and Disaster.

Typology or Classification of Hazards and Disasters: Natural – Extra Terrestrial, Geologic/Seismic, Hydro – Meteorological, Biological, etc.; Human Induced (Anthropogenic) – War, Fire, Industrial Pollution, Accidents (Transport, Industrial, Technological, etc.), Oil Spills, HYV/AIDS, Drug Addicts, Communal/Political Riots; Mixed (Natural and Human Induced Together) – Bird – Flu, Water Logging, Pollution, Landslide, etc.

Natural Hazard in Bangladesh: Classification/Types, Geographical Extent of Major Hazards, and Their Characteristics/Impacts.

Disaster Management: Conceptual Framework, Aims, Scope, Subject Matter and Approaches.

Fundamental Approach of Disaster Management of Bangladesh: History of Disaster Management, Paradigm Shift, Disaster Management Framework, and Institutions.

Elements of Disaster Management: Prevention, Mitigation, Adaptation, and Migration.

Disaster Risk Reduction (DRR) and Disaster Resilience:

Risk – Concepts, Factors, Risk Level, Relation with Hazards, Vulnerability and Capacity, Risk Profile Risk Estimation, Risk transfer.

Vulnerability – Vulnerability Profile (Physical, Environmental, Social, Economic, and Environment), Hazard Analysis and Mapping.

Response, Recovery, and Rehabilitation – Framework and Approaches of Response and Recovery, Pre-Disaster Phases (Warning, Evacuation, Practice, etc.), Post Disaster Phases (Search and Rescue, First Aid Medical Treatment, Rehabilitation and Reconstruction), Dimension of Disaster Recovery (Debris Management, Environmental Recovery, Protecting Historical and Cultural Resources, Retrofitting, Built Back Better).

Capacity – Definition, Relation with other DRR Elements.

Disaster Preparedness – Basic Concepts of Preparedness, Forecast and Warning System, Coping Mechanisms (Indigenous and Modern), Preparedness at different Levels (Family, Community/Local, National, Regional, and International), Rescue, Relief, Rehabilitation and Reconstruction.

Disaster Mitigation – Definition and Concepts of Mitigation, Various Approaches of Disaster Mitigation, Environmental Control and Land Use Planning, Structural and Non-Structural, Community Participatory Approach, Partnership Building and Networking (Regional and Global), Disaster Relief and Rehabilitation, Disaster Management Training and Education, Role of Media in Disaster Risk Reduction, Institutional Capacity Building.

Adaptation to Disaster: Adaptative Capacity and Its Determinants (Economic Resources, Technologies, Information and Skills, Infrastructure, Institution, Equity), Enhancing Adaptative Capacity, Migration as an Adaptation with Disaster.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Determine the hazards and disasters occurring in the world align with Bangladesh.
CO 2: Design the disaster management framework.
CO 3: Evaluate disaster risk reduction approach.
CO 4: Figure out resilience techniques in managing disaster.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2	3								
CO 3	2								
CO 4	3								
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓			
CO 2	✓				✓			
CO 3	✓				✓			
CO 4	✓				✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓					✓		
CO 2	✓					✓		
CO 3		✓			✓	✓		
CO 4		✓						

Books Recommended:

1. Center, A. D. (2012). Comprehensive Disaster Management Programme (CDMP-II).
2. Coppola, D. P. (2006). Introduction to international disaster management. Elsevier.
3. Goel, SL. (2006). Encyclopedia of Disaster Management. Deept & Deep Publications.
4. Paul, B. K. (2011). Environmental hazards and disasters: contexts, perspectives and management. John Wiley & Sons.
5. Smith, K (2013). Environmental hazards: assessing risk & reducing disaster.

Course No: GEE 0532 5121	Credit: 3.0	Year: MS	Semester: First
Course Title: Haor Ecology and Its Resources		Course Status: Theory	

Rationale of the Course:

A Haor is a wetland ecosystem in the northeastern part of Bangladesh which physically is a bowl or saucer shaped shallow depression. Understanding the physical setting of Haor and effective management of the natural resources of Haor is a necessary component of dealing with the challenges of resource depletion and global environmental change because Haor basin is an internationally important wetland ecosystem. The purpose of this course is to help students understanding the freshwater wetlands from the perspective of physical and social dynamics especially physical setting of Haor area, its biological resources and help to identify the process that degrade the wetland environment. This course contains freshwater wetland status and issues, dynamics of wetland soil, ecological characteristics of wetland, flora and fauna of Haor area and wetland management policies of Bangladesh.

Course Objectives:

The objectives of this course are –

1. Understanding the fundamental characteristics (physical, chemical, and biological) of Fresh water wetlands and their importance for the management of Haor.
2. Determined the possible impacts (both positive and negative) of the proposed interventions/projects.
3. Analyze the crop and fish production, protection of homesteads and infrastructure and conservation of biodiversity in the vast Haor area.
4. Identify the measure that prevent degradation of Haor resources and ensure sustainable management.
5. Recognizing the sources of pollution and Mineralization of perennial water during the dry season from residual fertilizer has led to eutrophication of the water bodies.
6. Identify the causes which are responsible for the extinction of flora and fauna diversity.

Course Contents:

Haor: Nature, Characteristics, Major Haors Classification
Haor Environment: Ecology, Ecosystem, Regions, Ecosystem services.
Resources of Haor: Sector wise resources, livelihoods, and benefits
Problems of Haor Regions: Environmental and man-made, Degradation, Pollution, Floods, and others.
Management System, Policy, and Strategies: Natural System; Innovated; International, National Govt Policies and Laws)

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Characterize fresh water wetlands' fundamental characteristics and management issues and strategies in the context of Bangladesh
CO 2: Apply knowledge on haor river system, soil characteristics, dynamics of Haor, flora and fauna diversity for better management
CO 3: Analyze data on haor river system, soil characteristics, dynamics of Haor, flora and fauna diversity
CO 4: Assess information, knowledge and arguments about haor management issues and its environment
CO 5: Revise international, national policies and strategies

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2					2		3		
CO 3							2	2	
CO 4					3				
CO 5					3				
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05	TL 06
CO 1	✓					✓
CO 2	✓	✓				
CO 3			✓	✓		✓
CO 4				✓	✓	✓
CO 5				✓	✓	✓

COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓				✓	✓	✓	✓
CO 2				✓	✓	✓	✓	✓
CO 3		✓		✓		✓	✓	✓
CO 4				✓	✓	✓	✓	✓
CO 5				✓	✓	✓		

Books Recommended:

1. Batzer, D.P. and Sharitz, R.R. eds., 2014. Ecology of freshwater and estuarine wetlands. Univ of California
2. Mitsch, W.J. and Gosselink J.G. (2007) Wetlands. 4th Edition, John Wiley & Sons, Inc.
3. Thomas R. Biebighauser, Wetland Drainage, Restoration, and Repair, Lexington, KY, University Press of Kentucky, 2007.
4. Mitsch, W.J., J. G. Gosselink, C. J. Anderson, and L. Zhang. 2009.Wetland Ecosystems. John Wiley & Son,Inc.,New York.
5. Wetland of Bangladesh, Md. Salar Khan, Bangladesh Centre for Advanced Studies, Nature Conservation Movement, 4 Aug 2009.

Course No: GEE 0532 5123	Credit: 3.0	Year: MS	Semester: First
Course Title: Paleogeography and Paleoenvironment		Course Status: Theory	

Rationale of the Course:

This course is intended for advanced graduate students who are interested in learning about the history of the earth's climate, environment and how paleoenvironmental studies can help them to learn more about the workings of the climate system and past environment. This course is an introduction to the methods of paleoclimate reconstruction and the current state of knowledge about the paleoclimate history of the Earth- from the early Earth to the last two millennia.

Course Objectives:

The objectives of this course are –

1. To explain to them about Paleogeomorphology and Paleoclimatology.
2. To make them understand the duration and characteristics of the quaternary environment.
3. To provide knowledge on how to reconstruct the biological, chemical, and physical nature of the environment.
4. To acquire information on the temporal and spatial characteristics of climate variability.
5. To describe and evaluate the past environment of Bangladesh with context to lithology, coastal stratigraphy, microfossil analysis.
6. To provide information on a series of cases and lessons upon which our understanding of environmental change can be constructed and tested.

Course Contents:

Paleogeomorphology and Paleoclimatology: meaning, scope and importance to study.
Quaternary Environment: its extents, duration, characteristics, and framework
Geomorphological Evidence: Glacial Landform; Periglacial landform, River terraces; dunes; weathering crust.
Lithological Evidence: Fluvial Deposits: - Facies and Beddings; Paleosols; Lake, Mire and Bog sediments; Loess sediment; Marine sediments; and Ice-core stratigraphy.
Biological Evidence: Pollen analysis; Diatom analysis; Foraminifera Analysis; Plant and Animal Macrofossils.
Chronological Evidence: C14 dating; Uranium series dating; Dendrochronology, varve chronology; Oxygen-isotope.

Climatic changes in the Past: Causes and significance; glacial periods; sea-level changes; human evolution and migration.
Paleogeomorphology and Paleoclimatology of Bangladesh: Quaternary Lithology. Coastal Stratigraphy; Climate change; Paleo-monsoon, Quaternary sea-level changes; Paleo shorelines; landforms and correlation, human occupancies.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Explain the characteristics and framework of the quaternary environment
CO 2: Demonstrate geomorphological, lithological, biological, and chronological evidence used in inferring paleoenvironmental change
CO 3: Analyze data of paleoclimate of Bangladesh
CO 4: Predict future climate change and issues associated with it from those evidences
CO 5: Reconstruct past climate changes and issues associated with it from those evidences

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2						3			
CO 3							3		
CO 4						3			
CO 5							3		
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓			
CO 2	✓	✓	✓	✓	✓			
CO 3	✓	✓	✓	✓	✓			
CO 4	✓	✓	✓	✓	✓			
CO 5	✓	✓	✓	✓	✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. Reconstructing Quaternary Environment (2nd Ed)- Lowe, Walker, Routledge (1997).
2. The Holocene; An environmental History (3rd Ed.)- Roberts, Wiley-Blackwell (1989).
3. An Introduction to the Quaternary Geology of Bangladesh- M.H. Monsur (1995).
4. Sea-Level Changes of Bangladesh: Last Ten Thousand Years- MS Islam, Asiatic Society of Bangladesh (2001).
5. Paleoclimatology- Reconstructing Climates of the Quaternary (3rd Edition)- Raymond Bradley, Academic Press (2014)

Course No: SPS 0314 5101	Credits: 3.0	Year: MS	Semester: First
Course Title: Advanced Research Methodology in Geography and Environment			Course Status: Lab

Rationale of the Course:

This course will be a pre-preparation for the advanced research in graduation level, where the students will learn to conduct research in proper ways. Development of a research proposal and constructing research design with focus on the relation between topics, problem statement, research questions and relevant theory and methods will be discussed thoroughly. Requirements for conducting advanced research regarding methodology development, data collection and analysis, report writing, language, use of references and theory will be guided. Various ethical issues and other related problems will be evaluated also. The course will be completed by submitting an assignment report focusing on an individual project work that forms the basis for the advanced research with the background, problem, theoretical framework, and methods.

Course Objectives:

The objectives of this course are –

1. To learn the ethical issues and consideration of research work.
2. To develop the research proposal with a timeframe and budget fixation.
3. To construct a research design.
4. To adopt the methods and methodology for research.
5. To accomplish the writing of a research report.

Course Contents:

Ethical Issues and Consideration for Research in the Field of Geography and Environment.

Define Key Concepts: Topics selection, Background of the study, Problem statement, Research questions, Objectives, Study area selection, Rationale of the study, Significance and outcomes of the study, Limitations.

Research Proposal: Development of a research proposal, Fixation of timeline, Budget, Submission and Evaluation.

Research Design: Purpose statement, Techniques, Hypothesis, Methodology, Settings for the research study, Objections, Timeline, Measurement of analysis.

Literature Review: Search for relevant literature, evaluate sources, identify themes, debates and gaps, evaluate relevant definitions, theories and models, Outline the structure.

Methodology in Geography and Environment: Methodological approach, Methods of data selection and collection, Methods of analysis, Evaluate and justify methodological choices.

Data Collection and Analysis in the Field of Geography and Environment: Types of data: primary and secondary, Survey design for data collection, Quality assurance and control, Data processing, Data analysis techniques, Barriers to effective analysis, Software for data analysis.

Report Writing: Title page, Abstract, Table of contents, List of table and figures, Acknowledgement etc., Introduction, Background study, Material and methods, Analysis, Results and discussion, Conclusion, Recommendations, References, Appendices.

Appendix.

Presentation of the Thesis.

Students will submit an individual assignment that forms the basis for the master thesis with the background, problem, theoretical framework, and methods.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Review the concept of a research study in light of Geography and Environment.
CO 2: Develop research design with theoretical framework.
CO 3: Prepare a research methodology with appropriate data analysis techniques.
CO 4: Evaluate the ethical issues related to the research work.
CO 5: Generate research report with proper presentation techniques.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3	3							
CO 2	3	3							
CO 3			3		2				
CO 4					3	3	3	2	1
CO 5					3	3	3	2	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓		✓	
CO 2	✓	✓	✓	✓	✓		✓	
CO 3	✓	✓	✓	✓	✓		✓	
CO 4	✓	✓	✓	✓	✓		✓	
CO 5	✓	✓	✓	✓	✓		✓	
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1				✓	✓	✓	✓	
CO 2				✓	✓	✓	✓	
CO 3				✓	✓	✓	✓	
CO 4				✓	✓	✓	✓	
CO 5				✓	✓	✓	✓	

Books Recommended:

1. How to Do Your Dissertation in Geography and Related Disciplines- Tony Parsons, Peter G Knight; Routledge (2015).
2. How to Write Your First Thesis- Paul Gruba, Justin Zobel; Springer Nature (2017).
3. How to Write a Thesis- Umberto Eco; The MIT Press (1977).
4. Research Methods in Geography: A Critical Introduction- Basil Gomez (Editor), John Paul Jones III (Editor); (2010).
5. The Dissertation Journey: A Practical and Comprehensive Guide to Planning, Writing, and Defending Your Dissertation- Carol M. Roberts; SAGE (2010).

Course No: SPS 0532 5112	Credits: 3.0	Year: MS	Semester: First
Course Title: Application of Unmanned Aerial Vehicle (UAV-DRONE)			Course Status: Lab

Rationale of the Course:

The unprecedented development of Unmanned Aerial Vehicle (UAV-DRONE) technology has created vast opportunities in areas such as mapping, environmental monitoring, agriculture, disaster management, urban and landuse planning. This course aims to prepare students with both the theoretical understanding and practical abilities necessary for drone operations, data acquisition, and data processing, allowing them to use UAV technology with confidence in real-world applications. Attention will be specifically directed towards mastering the drone for high-precision surveys.

Course Objectives:

The objectives of this course are –

1. Understand the fundamentals of UAV technology, components, and operation principles.
2. Plan and execute UAV-based field surveys for various applications.
3. Operate the DRONE safely and effectively.
4. Process UAV imagery for mapping, analysis, and reporting.
5. Apply UAV data in areas such as land use planning, environmental monitoring, disaster assessment, and resource management.

Course Contents:

Introduction to UAV Systems: History and evolution, types, classifications, and components.
UAV (DRONE) Platform: Introduction with DRONE parts, Specifications, capabilities, and operational modules.
UAV Regulations and Safety: Drone operation laws, flight safety protocols, and ethical considerations.
Flight Planning and Mission Preparation: Mission design, RTK setup, and pre-flight checklists.
Image Acquisition: Techniques for image capture (overlap, angle, resolution) using manual and automated missions.
Image Processing: Transferring imagery, creating orthomosaics, 3D modeling, using software like DJI Terra, Pix4D, and Agisoft Metashape.
Applications of UAV Images: Land use/land cover mapping, environmental monitoring, infrastructure inspection, and disaster management.
Mini-Project: Students will conduct a full UAV survey mission and present their findings, including maps and analyses.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO1: Explain UAV components, principles, and applications.
CO2: Plan and execute UAV survey missions independently.
CO3: Operate the DRONE in a safe and efficient manner.
CO4: Process and analyze UAV imagery to generate orthomosaics, models, and thematic maps.
CO5: Apply UAV-based solutions to address real-world geo-environmental challenges.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	2	3						
CO 2							3	3	3
CO 3				2	1				
CO 4						1	2		
CO 5							3		3
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05	TL 06
CO 1	✓	✓			✓	
CO 2	✓		✓			
CO 3	✓				✓	
CO 4	✓				✓	
CO 5	✓	✓				✓

COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓			✓		✓		
CO 2	✓			✓		✓		
CO 3		✓		✓		✓		
CO 4		✓		✓		✓		
CO 5				✓		✓		

Books Recommended:

1. Fundamentals of Capturing and Processing Drone Imagery and Data - Amy Frazier, Kunwar Singh; CRC Press (2021).
2. Handbook of Unmanned Aerial Vehicles - George J. Vachtsevanos, Kimon P. Valavanis; Springer Netherlands (2014).
3. Small Flying Drones: Applications for Geographic Observation - András Sik, Gergely Szabó, Gianluca Casagrande; Springer International Publishing (2017).
4. Unmanned Aerial Remote Sensing: UAS for Environmental Applications - Alexander Karachok, Billy J. Gregory, David R. Green; CRC Press, Taylor & Francis Group (2023).

Course No: GEE 0314 5211	**Credit: 3.0**	**Year: MS**	**Semester: Second**
Course Title: Urban Environmental Management		**Course Status: Theory**	

Rationale of the Course:

Urban Environmental Management (UEM) responds to urban growth and environmental problems from the management and planning perspectives to contribute to the development of sustainable, inclusive, and resilient cities. The core objectives are understanding dynamics of urban regions and developing effective interventions using various decision support systems and instruments in multi-stakeholder settings. UEM draws on and integrates approaches and perspectives in established disciplines of urban planning, urban and regional development, urban economics, sustainable development, and urban policy and management studies into a distinctive framework of problems, issues and questions concerning the urban environment, in a developing country/city context.

Course Objectives:

The objectives of this course are –

1. To recognize the impact of urban environmental problems as well as environmental in justice.
2. To explain urban environmental management with some theoretical approaches such as sustainable development, ecological footprint urban environmental transition.
3. To analyze the approaches and tools in urban environmental management with the institutional setting and
4. To concern about the assessment of urban environmental issues and options, reduction of natural disaster risk in cities and global initiatives.
5. To acquire knowledge about urban environmental problems in Bangladesh with guiding principles

Course Contents:

Introduction to Urban Environment: Definition and concepts of urban environment, urban environmental systems and risks in the urbanizing world, Factors affecting the urban environment, Interaction between urban development and the urban environment, Disproportionate impacts of urban environmental problems, fighting poverty and environmental injustice in cities, and Contrasting Brown, Grey and Green priorities.

Introduction to Urban Environmental Management: Definition and concepts of environmental management, the complexity of urban environmental management. Comparison with other theoretical approaches, such as political ecology, ecological modernization, ecological footprint, urban governance, environmental governance, sustainable development, and urban environmental transition.

Approaches and Tools in Urban Environmental Management: The institutional setting for urban environmental management, Constraints, and opportunities of urban environmental management in the world, The concept of sustainable city, the good city, the inclusive city, the unruly cities, neoliberal environment, and urban agriculture.

Urban Environmental Management in the Context of Third World: Assessing urban environmental issues and options, providing environmental services and housing, Reducing natural disaster risk in cities, global initiatives of urban environmental management.

Urban Environment Problems in Bangladesh.

Guiding Principles of Urban Environmental Management: Ecological, economic, social and management.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Extrapolate the basic concepts of urban environment (urban environment systems, development and problems).
CO 2: Describe urban environmental issues and environmental injustice in cities.
CO 3: Describe the theoretical approaches and tools in urban environmental management.
CO 4: Characterize different types of cities and solve urban environmental problems in the context of Bangladesh.
CO 5: Interpret the principles of urban environmental management and global initiatives.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1		2	1						
CO 2				2					
CO 3							3		
CO 4								2	
CO 5								2	2
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓		✓	
CO 2	✓	✓	✓	✓	✓		✓	
CO 3	✓	✓	✓	✓	✓		✓	
CO 4	✓	✓	✓	✓	✓		✓	
CO 5	✓	✓	✓	✓	✓		✓	
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓			✓		✓	✓	✓
CO 2	✓		✓		✓	✓	✓	✓
CO 3		✓	✓	✓	✓	✓	✓	✓
CO 4		✓		✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓		

Books Recommended:

1. Urban Geography – J.H. Johnston.
2. Readings in Urban Geography – H.M. Mayer and C. F. Kohn.
3. Urban Geography – J.H. Johnston.
4. Urban Research Method – J.P. Gibbs.
5. Urban Bangladesh: Geographic Studies ed. – N. Islam and R.M. Ahsan.

Course No: GEE 0532 5213	**Credit: 3.0**	**Year: MS**	**Semester: Second**
Course Title: Coastal Geography and Environment		**Course Status: Theory**	

Rationale of the Course:

This course has been designed to make the students specialize in coastal environments. This type of specialization will develop their ability to understand the coastal environment and solve various problems of the coastal environment.

Course Objectives:

The objectives of this course are –

1. To familiarize with basic concepts of coast
2. To introduce with coastal resources and their management
3. To understand the coastal processes
4. To know the coastal problems and their management

Course Contents:

Coastal and Marine Environment: Meaning, Multidisciplinary scope, Importance of study.

Relief of the Ocean: Continental shelves and slope, Ocean floor, coral reef relief of the Atlantic, Pacific and Indian Ocean

Ocean Sediments: Source of sediments, types, characteristics, depositional environments.

Marine Environment: Temperature; salinity; causes, changes, vertical and horizontal distribution, Implication. Marine climatic Zone, EL-Nino

Sea-level Change: Definition, causes, past, present, and future trends of sea level changes, Consequences of sea level changes.

Coast: Definition, classification Delineation, and characteristics,

Coastal Landform: Cliff, Sand dunes, Shores, beaches, Tidal flat Mud flat, lagoons.

Coastal Sediments: Basic Concept of Sediment transport, Sediment sources, sizes, distribution

Estuaries: Definition, types, processes, and morphology

Marine and Coastal Resources: Flora and Fauna, Coral Reef, Mineral Resources,

Marine and Coastal Disaster: Cyclone, Storm Surges, Tsunami, Bank Erosion, Salinity Intrusion

Coastal Zone Management: Concept, Policies, ICZM, Land Reclamation, Coastal Zoning, Protection and Defense, Management techniques, Community Participation, Coastal Conservation

Coastal Geography of Bangladesh: Classification, characteristics, human intervention

Bay of Bengal with Emphasis on EEZ of Bangladesh and Estuaries: Resource Utilization, Sea level change. Government policy on Bay of Bengal.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Explain the coastal environment (Understand)
CO 2: Demonstrate coastal process
CO 3: Analyze coastal problems
CO 4: Evaluate coastal policies
CO 5: Prescribe solutions for coastal problems

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2							2		
CO 3							2		
CO 4						3			
CO 5					3		3		
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓			
CO 2	✓	✓	✓	✓	✓			
CO 3	✓	✓	✓	✓	✓			
CO 4	✓	✓	✓	✓	✓			
CO 5	✓	✓	✓	✓	✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. D. Raffaelli and S. Hawkins Intertidal Ecology (1999) 2nd, Kluwer Academic Publisher
2. J. Pathick A. Introduction to Coastal Geomorphology (1986) Edward Arnold
3. E.C. Birds, Submerging Coast (1993) John Wiley
4. MS Islam, Sea-Level Changes of Bangladesh: Last Ten Thousand Years, (2001) Asiatic Society of Bangladesh

Course No: GEE 0532 5215	Credit: 3.0	Year: MS	Semester: Second
Course Title: Climate Change, Government Policy, and Action Strategy		**Course Status: Theory**	

Rationale of the Course:

This course begins with climate and its elements and components, and the local impact of sea-level rise due to climate change. To understand how excess carbon dioxide is rapidly changing the climate, the Earth's energy budget and then focus on greenhouse gases. Carbon dioxide and its ability to absorb and re-radiate heat are key in understanding climate change. Climate change requires global action with solutions. Global climate change and its impacts on people and resources pose serious global challenges and adaptations should choose mitigation strategies to reduce climate change. Students will be able to analyze the impact of climate change by studying different national, regional, and international responses to climate change. Students will be able to compare climate change mitigation and adaptations strategies.

Course Objectives:

The objectives of this course are –

1. To improve the knowledge of climate change and its elements and components.
2. To introduce government policy**,** adaptation strategies, NGO activities, action plan etc.
3. To concern about the impacts of climate change in migration pattern, land use change, crop production and food security, change in forest and coastal biodiversity along with Bangladesh.
4. To explain the national, regional, and international response and international dialogues on climate change, mitigation, adaptation, and conflict on Climate Change.
5. To recognize the ideas of world climate politics and climate politics.

Course Contents:

Climate Change: Concept, historical perspective, present condition.

Elements of Climate Change: Basic (Temperature, Humidity, Precipitation, Sky conditions (presence or absence of clouds), Solar radiation, Wind, Vegetation) and Physical (Lithosphere, hydrosphere, atmosphere, and biosphere).

Climate Change Components: Global warming, sea level rise, carbon emission, glacial cover, greenhouse gas, ozone layer depletion, El Nino and La Nina.

Climate Change and its Possible Global Impacts: Migration pattern, land use change, crop production and food security, change in forest and coastal biodiversity.

National, Regional and International Response to Climate Change: International Treaties, Protocols, IPCC, and UNFCCC (historical development, success, and failure).

International Dialogues on Climate Change Mitigation, Adaptation, and Conflict: Stockholm Declaration, Rio Summit, and decisions in other successive international meetings until now.

Climate Change and World Climate Politics: Grouping among Countries (Annex I, Annex II, Non- Annex, OECD, EIT, AOSIS, LDC, etc.), Clean Development Mechanism (CDM), Carbon Trading, National and Individuals Interest, Climate Ethics and Justice.

Climate Change in the Context of Bangladesh: Temperature/rainfall pattern, drought, flood, and cyclone; Government Policy**:** Adaptation, government and local level participation in adaptation strategies NGO activities, Bangladesh Climate Change Strategic and Action plan, National Adaptation Program of Action (NAPA).

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Acquire knowledge about historical perspective and current condition of climate change.
CO 2: Identify the elements and components of climate change along with its potential impacts.
CO 3: Summarize the concerns and politics of international delegates on climate change.
CO 4: Explore the pattern of climate change and government policy in Bangladesh.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	2							
CO 2	1	2							
CO 3					3			2	
CO 4		2			3				
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05	TL 06
CO 1	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓

COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓		✓	✓	✓	✓	✓	✓
CO 2	✓			✓		✓	✓	✓
CO 3	✓	✓	✓			✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. Mapping Vulnerability: Disasters, Development, and People (2004), Bankoff G., Frerks G. & Hilhorst D. Earthscan. UK.
2. The Development of Atmospheric General Circulation Models: Complexity, Synthesis and Computation (2011). Donner L., Schubert W. & Somerville R. Cambridge University Press. UK.
3. Climate Change Vulnerability and Adaptation in Asia and the Pacific (1996). Erda L., Bolhofer W.C., et al. Springer. Netherlands.
4. Climate Change Science: A Modern Synthesis. Farmer & Cook (2013) Vol-1. Springer.

Course No: SPS 0532 5217	Credit: 3.0	Year: MS	Semester: Second
Course Title: Environment, Population and Sustainable Development in Bangladesh		Course Status: Theory	

Rationale of the Course:

This course has been designed to enrich the students with up-to-date knowledge about the contemporary environmental issues of Bangladesh. Thus, it will help them to develop skills to contribute in ensuring sustainable development of Bangladesh.

Course Objectives:

The objectives of this course are –

1. To introduce the students with current environmental problems/issues in the context of Bangladesh
2. To familiarize the students with the concept of sustainable development
3. To make the students capable in understanding the relationship between environmental change and sustainable development in Bangladesh

Course Contents:

Environmental Problems: Definition, classification.

Problems and Impacts Syndromes: Water pollution, Air pollution, Deforestation, Soil erosion and degradation, Drought, Depletion of biodiversity, Natural hazards and disaster, Climate change, Flood, Salinity, Coastal degradation, Sea-level rise, Severe overpopulation, Structural Intervention of Man on Environment, Dams, Polders, Embankment, etc.

Sustainable Development: Concept, historical perspective. Relationship between Environmental Change and Sustainable Development.

Environmental Situation of Bangladesh including Discussion on National Conservation.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Determine different environmental problems in Bangladesh.

CO 2: Evaluate the impacts and syndromes of the environment.

CO 3: Formulate the relationship between sustainable development and environmental change.

CO 4: Critiques of the environmental situation in Bangladesh are based on national conservation efforts.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2	3								
CO 3	2								
CO 4	3							1	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓			
CO 2	✓				✓			
CO 3	✓				✓			
CO 4	✓				✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓					✓		
CO 2	✓					✓		
CO 3		✓			✓	✓		
CO 4		✓						

Books Recommended:

1. SEHD (Society for Environment and Human Development). (2002). Bangladesh Environment Facing the 21st Century.
2. Selim, S. A., Saha, S. K., Sultana, R., & Roberts, C. (Eds.). (2018). *The Environmental Sustainable Development Goals in Bangladesh*. Routledge.
3. Harper, C., & Snowden, M. (2017). Environment and Society: Human Perspectives on Environmental Issues (6th ed.). Routledge.
4. Momtaz, S., & Shameem, M. (2015). *Experiencing climate change in Bangladesh: Vulnerability and adaptation in coastal regions*. Academic Press.
5. Rahman, M. M. (2020). Achieving Sustainable Development Goals in Bangladesh: An Organizational Analysis. *Available at SSRN 3779081*.
6. Roy, S. (2019). *Climate change impacts on gender relations in Bangladesh: socio-environmental struggle of the Shora forest community in the Sundarbans Mangrove Forest* (Vol. 29). Springer.
7. Martin, M. (2017). *Climate, Environmental Hazards and Migration in Bangladesh*. A report on climatic Hazard.

Course No: GEE 0314 5219	Credit: 3.0	Year: MS	Semester: Second
Course Title: Geography of Tourism		Course Status: Theory	

Rationale of the Course:

The tourism phenomenon has its roots in the human need to see other places and discovering the unknown areas and the geography refers to the research on spatial dispersions, climatic conditions, and physical conditions of an area. Human beings seek and try to see things they do not have in their geography, and for this reason they try to visit different geographies. Hence, geographical features of a destination may become the main attraction for tourists. Tourism and Geography are so closely related that the success of tourism activities is dependent on the geographical conditions. So, tourism needs a physical geography for its ventures.

Course Objectives:

The objectives of this course are –

1. To discover the unknown areas on spatial dispersions, climatic conditions, and physical conditions of an area.
2. To know the success of tourism activities is dependent on the geographical conditions.

Course Contents:

Introduction to Tourism: Definition, concept, scope and Approaches.

Classification of Tourism: Land Base, Ocean Base, Forest Base.

Tourist Attraction: Natural and Man-made or Cultural elements.

Global Tourism: East and West world and South Asia.

Tourism and Economy: Environment; Prospect of Ecotourism.
Tourism and Blue Economy.

Tourism of Bangladesh: History, Scope, Economic, Ecological challenges, Coastal Tourism of Bangladesh.

Communication Skills in Tourism: Developing Effective Communication Skills, Non-Verbal Communication Skills, Verbal Communication Skills, The Choice of Words

Hospitality and Tourism: What Makes Good Hospitality, Benefits of Hospitality in Tourism, Ways of Expressing Hospitality, where is Hospitality needed in Tourism? Transportation Hospitality, Airline Hospitality Cruise, Ship Hospitality, Car Rental Hospitality, Accommodation Hospitality, Restaurant Hospitality.

Tourist Security & Safety: Travel Preparation, Other Pre-travel Security Measures, Steps to a successful personal security program, International Travel Security, Personal Travel Safety.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Articulate tourism as a discipline and its concept and scope
CO 2: Classify global tourism and tourism of Bangladesh
CO 3: Evaluate the infrastructural development and communication skills needed for sustainable tourism
CO 4: Explore the safety and security measures in tourism.
CO 5: Prescribe suggestions for different problems in tourism of Bangladesh

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3	2							
CO 2					2				
CO 3		3				2			
CO 4							3		2
CO 5							2	1	3
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓	✓	✓	✓			
CO 2	✓	✓	✓	✓	✓			
CO 3	✓	✓	✓	✓	✓			
CO 4	✓	✓	✓	✓	✓			
CO 5	✓	✓	✓	✓	✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓	✓	✓	✓	✓	✓	✓	✓

Books Recommended:

1. The Content of Tourism. -Airey, d. And Johnson, s. (1999). Tourism Management 20(2)
2. Hopes, Dreams and Reality: An Investigation into the Expectations and Experiences of the Tourism Graduates. - Dewar, k. Sayers, j. And Meyer, d. (2002). Journal of Teaching in Travel and Tourism 2(1): 1-18.
3. Sustainable Tourism Supply Chain Management: Influences, Drivers, Strategies and Performance by Shudhanshu Joshi
4. A Geographical Approach: From Invention to Gourmet Tourist Destinations by Olivier Etcheverria
5. Cultural and Tourism Innovation in the Digital Era by Vicky Katsoni, Thanasis Spyriadis

Course No: GEE 0314 5212	Credits: 5.0	Year: MS	Semester: Second
Course Title: Project on Bangladesh			Course Status: Project

Rationale of the Course:

The course designed for the students to conduct a project on Bangladesh in the field of Geography and Environment. This is a process-oriented course, where students will compile with reading, research, writing, and presentations. Students will carry out a project for better understanding of geographical problems. Students will be able to apply theoretical knowledge in real life. The students will accomplish his/her research project under the supervision of the assigned supervisor.

Course Objectives:

The objectives of this course are –

1. To make the students capable of conducting a geographical research scientifically
2. To develop the practical skills for applying latest tools and techniques in research
3. To produce competent graduates for the professional field.

Course Contents:
Designing a Scientific Geographic Research
Preparing the Proposal for a Research Project
Generating and Working with Data in Physical/Human Geography
Representing and Interpreting Geographical Data

Course Learning Outcomes (COs):
After the successful completion of the course, students will be able to –

CO 1. Develop research project.
CO 2. Prepare project proposal.
CO 3. Determine in what manner is sampling/measurement to be done.
CO 4. Analyze data using appropriate quantitative/representation techniques.
CO 5. Present findings appropriately.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2	3								
CO 3	2								
CO 4	3								
CO 5								1	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓			
CO 2	✓				✓			
CO 3	✓				✓			
CO 4	✓				✓			
CO 5	✓				✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓					✓		
CO 2	✓					✓		
CO 3		✓			✓	✓		
CO 4		✓						
CO 5				✓		✓		

Books Recommended: To be determined in consultation with the supervisor(s).

Course No: SPS 0532 5201	**Credits: 3.0**	**Year: MS**	**Semester: Second**
Course Title: Advanced Techniques in Geography and Environment (Lab)			**Course Status: Lab**

Rationale of the Course:
This course provides advanced training in research methods used by geographers in different fields of geography and environment. Accordingly, it is designed to prepare the students for undertaking research within and beyond the university context and seeks to equip them with key employability attributes for professional careers. In so doing, the module will introduce a range of quantitative, qualitative, and spatial methods that geographers use in research and their applications for wider environment. The course will be taught using lecture-based classes, workshops, and tutorials, as well as taking the students on a field trip on advance issues related to the geography and environment. Research methods are presented considering how they are utilized in practice, drawing on examples from the field of geography and environment research.

Course Objectives:
The objectives of this course are –

1. To acquire knowledge on spatial analysis related to the advance field of geography and environment.
2. To enable the students to understand different modern approach of earth observation techniques.
3. To be capable for studying the paleoenvironmental and microclimatic issues with adoption of effective techniques.
4. To develop the qualitative and participatory approaches
5. To support the students in translating their learning about research methods into identifiable and tangible graduate attributes to enhance their employability.

Course Contents:
Advanced Spatial and Statistical Analysis: Analysis of spatial patterns, point distributions, and clustering; introduction to GWR and spatial regression models; dimensionality reduction.
Remote Sensing and Earth Observation Techniques: Satellite data processing using Google Earth Engine (GEE); integration of remote sensing data with machine learning and introductory deep learning approaches for land use, climate indicators, and risk mapping.
Paleoenvironmental and Microclimatic Techniques: Microclimate observation and mapping using field instruments; introduction to soil micromorphology and basic lab analysis; identification and interpretation of environmental proxies including macro- and microfossils (tree rings, pollen, diatoms, foraminifera); case applications in environmental reconstruction and hazard interpretation.
Qualitative Spatial and Participatory Approaches: Cognitive mapping, mental maps, and participatory GIS; qualitative data collection (observation, interviews); spatial storytelling and thematic analysis.
Integrated Field and Laboratory Work: Design and conduct of field projects using GPS, drones, and sensors; ethical considerations in fieldwork; integration and visualization of field data using maps, dashboards, and lab reports.

Course Learning Outcomes (COs):
After the successful completion of the course, students will be able to –

CO 1. Study the relevance and significance of different forms of knowledge and approaches in geography and environment.
CO 2. Develop the capabilities of analytical approaches using different techniques.
CO 3. Evaluate the issues involved in research design and its application in the context of geography and environment using different qualitative techniques.
CO 4. Analyze specialized techniques and approaches involved in collecting, analyzing, and presenting geographical information - qualitative, spatial, and participatory.
CO 5. Summarize the role of research methods to develop a coherent graduate attribute.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1		3			3		3		
CO 2				3					
CO 3			2		3				
CO 4							3		
CO 5		3			2			3	
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓	✓		✓	✓		✓	
CO 2	✓	✓	✓	✓			✓	
CO 3	✓	✓	✓		✓		✓	
CO 4		✓	✓	✓	✓		✓	
CO 5		✓			✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓	✓	✓	✓	✓	✓	✓	✓
CO 2	✓	✓	✓	✓	✓	✓	✓	✓
CO 3	✓	✓	✓	✓	✓	✓	✓	✓
CO 4	✓	✓	✓	✓	✓	✓	✓	✓
CO 5	✓		✓				✓	✓

Books Recommended:

1. Clifford, N. and Valentine, G., (2003) Key Methods in Geography. Sage.
2. Denzin, N. and Lincoln, Y. (1994) Handbook of Qualitative Research.
3. Flick, U. (1998) Introduction to Qualitative Research. Sage
4. Frew, J. (1986) Geography fieldwork. Macmillan
5. Holliday, A. (2002) Doing and Writing Qualitative Research. Sage
6. Limb & Dwyer (2001) Qualitative Methodologies for Geographers: Issues & Debates
7. Silverman, D. (1993) Qualitative Data – Methods for Analyzing Talk, Text and Interaction. Sage
8. Berry & Marble (1968) Spatial Analysis: a Reader in Statistical Geography. P. Hall.
9. Clifford & Valentine, (2003) Key Methods in Geography. Sage
10. Ebdon, D. (1985) Statistics in Geography, Blackwell; Oxford).
11. Frew, J. (1986) Geography fieldwork. Macmillan.
12. Gregory, S. (1973) Statistical Methods and the Geographer. Longman.
13. Griffith, D. & Amrhein, C. (1991) Statistical Analysis for Geographers. Prentice-Hall.
14. Hammond, R. and McCullagh, P. (1978) Quantitative techniques in Geography: an introduction. Clarendon Press, Oxford.

Course No: GEE 0314 5210	Credits: 2.0	Year: MS	Semester: Second
Course Title: Viva-voce		Course Status: Oral	

Rationale of the Course:
Viva-voce is an academic examination and assessment method. The course is a valid and novel method of assessing learning outcomes such as application of deep learning, application of theory to practice, and problem-solving skills. This is possible only when this tool is used thoughtfully, rationally, objectively, and relevantly.

Course Objectives:
The objectives of this course are –

1. To evaluate a student's MS study.
2. To enable dialectic communication between the examiner and student.
3. To develop the attitude, thoughts, concepts, and convincing power of a student.
4. To provide invaluable experience for career interviews.

Course Contents: MS Curriculum.

Course Learning Outcomes (COs):

After the successful completion of the course, students will be able to –

CO 1: Evaluate the depth of knowledge in Geo-environment.
CO 2: Create better communication skills for sharing knowledge and views.
CO 3: Increase the convincing power for proper decision making.
CO 4: Characterization of the attitude for well-behaved and manner.
CO 5: Sharing thoughts and concepts for application of knowledge in future profession.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2			3					3	
CO 3		2						3	
CO 4	3								
CO 5	3						3		3
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓			
CO 2	✓							
CO 3					✓			
CO 4		✓						
CO 5	✓							
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓			✓		✓		
CO 2	✓			✓		✓		
CO 3		✓		✓		✓		
CO 4		✓		✓		✓		
CO 5				✓		✓		

Books Recommended: MS Curriculum.

Course No: GEE 0532 5332	Credits: 12.0	Year: MS	Semester: Third
Course Title: Thesis		Course Status: Research	

Rationale of the Course:
This research-based thesis course designed for the students of this MS program, offers students the opportunity to work on a comprehensive, individual project that demonstrates mastery of interaction between man and environment in relation to time and space. The student will conduct research on a self-chosen subject in the field of Geo-Environment, but they will always be encouraged to choose such a research topic in consultation with the supervisor(s) that is significant for Bangladesh and compliable within the given duration.

Course Objectives:
The objectives of this course are –

1. Provide platform for hands-on practice with geo-environmental issues.
2. Assess and evaluate students' skill and capability in the field of Geo-Environment.
3. Produce competent graduates for higher education.
4. Help students to have their publications.
5. Produce competent graduates for the professional field.

Course Contents:
The student conducts research on a topic within the field of Geo-Environment. Students can choose their own subject, if it fits in with the area of research of the department. The student asks one of the teachers of the department to supervise him or her. The student's research can have maximum two supervisors at a time.

Course Learning Outcomes (COs):
After the successful completion of the course, students will be able to –
CO 1: Acquire in-depth knowledge in the specific field of study.
CO 2: Apply knowledge and skills in the related field.
CO 3: Interpret the results of the research, also in the context of theoretical and empirical research reported by others in scientific literature.
CO 4: Report the research to the academic community through papers and presentations.

Mapping Course Learning Outcomes (COs) with the POs:

CO / PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3								
CO 2	3								
CO 3	2								
CO 4	3								
Numeric numbers represent: 3. Strong 2. Moderate 1. Weak									

Mapping Course Learning Outcomes (COs) with the Teaching Learning (TL) and Assessment Strategy:

COs/TL	TL 01	TL 02	TL 03	TL 04	TL 05		TL 06	
CO 1	✓				✓			
CO 2	✓				✓			
CO 3	✓				✓			
CO 4	✓				✓			
COs/CA/SA	CA 01	CA 02	CA 03	CA 04	CA 05	SA 01	SA 02	SA 03
CO 1	✓					✓		
CO 2	✓					✓		
CO 3		✓			✓	✓		
CO 4		✓						

Books Recommended:
To be determined in consultation with the supervisor(s).

Appendix I

Teaching Learning (TL) and Assessment Strategy:

Code	**Teaching Learning (TL) Strategy**	
TL 01	Lecture using board/ LCD projectors/ OHP projectors.	
TL 02	Assignment/ Project/ Seminar/ Workshop/ Tutorial.	
TL 03	Laboratory/ Other teaching aids (Audio-visual: film and documentaries, virtual classroom etc.	
TL 04	Guest lectures/ Industrial visit/ Field visit.	
TL 05	Self-learning using reference books/ Research articles/ Case study/ Other online materials.	
TL 06	Simulation/ Field documentation.	
Code	**Assessment Strategy**	
CA 01	Midterm Examination 1	Continues Assessment (CA)
CA 02	Midterm Examination 2	
CA 03	Quiz	
CA 04	Assignment	
CA 05	Presentation (Individual/ Group)/ Viva voce	
SA 01	Semester end examination	Summative Assessment (SA)
SA 02	Semester end oral examination	
SA 03	Semester paper evaluation	

3. Master's by Research:

Syllabus for Master's by Research in Geography and Environment:

The duration of Master's by Research in GEE is 2 year and are spreader over 4 semesters. The GSC may offer coursework from the available courses of the Department of GEE (if required). A candidate must complete the assigned 48 credits with dissertation. Maximum academic years of completion is 3 years and are spreader over 6 semesters.

First Semester:

GSC will offer required credits (if necessary) from the following courses.

Course No.	Course Title	Hours/Week		Credits
		Theory	Lab	
GEE 0314 5111	Migration and Refugee Management	3	0	3.0
GEE 0532 5113	Regional Planning and Development	3	0	3.0
GEE 0532 5115	Resource Management	3	0	3.0
GEE 0314 5117	Biodiversity and Conservation	3	0	3.0
GEE 0314 5119	Natural Hazards and Disaster Management	3	0	3.0
GEE 0532 5121	Haor Ecology and its Resources	3	0	3.0
GEE 0532 5123	Paleogeography and Paleoenvironment	3	0	3.0
GEE 0314 5112	Advanced Research Methodology in Geography and Environment (Lab)	0	6	3.0

Second Semester:

GSC will offer required credits (if necessary) from the following courses.

Course No.	Course Title	Hours/Week		Credits
		Theory	Lab	
GEE 0314 5211	Urban Environmental Management	3	0	3.0
GEE 0532 5213	Coastal Geography and Environment	3	0	3.0
GEE 0532 5215	Climate Change, Government Policy, and Action Strategy	3	0	3.0
GEE 0532 5217	Environment, Population and Sustainable Development in Bangladesh	3	0	3.0
GEE 0314 5219	Geography of Tourism	3	0	3.0

Third and Fourth Semester:

Course Title	Hours/Week Theory+Lab	Credits
Dissertation	48	48

Course Outline:

The details of the course contents are same as designed in the Master's by Coursework and Master's by Mixed Mode section.

4. Doctoral by Research:

Syllabus for Doctoral by Research Program in Geography and Environment:

The duration of Doctoral by Research in GEE is 3 year and are spreader over 6 semesters. A candidate must complete 72 credits for the Doctoral by Research degree. The GSC may suggest any theoretical coursework from the available courses of the Department of GEE (if required). Maximum academic years of completion is 6 years and are spreader over 12 semesters.

Program Outline:

No.	Description	Time
1	One Public Seminar	1st Year
2	One Public Seminar	2nd Year
3	One Public Seminar	3rd Year
4	Thesis Submission	4th Year