



Curriculum
(Corrected and Completed)
**Bachelor of Science (Honours) Degree in
Geography and Environment**

Academic session: 2024-25

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**Department of Geography and Environment
University of Dhaka**

Table of Contents

The University of Dhaka.....	1
Vision of the University	1
Mission of the University (UM)	1
Department of Geography and Environment.....	2
Vision of the Department.....	2
Mission of the Department	2
Academic Programmes.....	3
Academic and Research Facilities.....	3
Sirajul Islam Chowdhury Cartography Laboratory.....	3
Prof. Dr. M. Maniruzzaman Miah Physical Geography Laboratory	4
Prof. Dr. K. B. Sajjadur Rasheed Environmental Laboratory	4
Prof. Dr. Rosie Majid Ahsan GIS Laboratory	4
Remote Sensing (RS) Laboratory	4
Prof. Nazrul Islam Urban Studio.....	4
Disaster Research Training and Management Centre (DRTMC).....	4
Extracurricular Activities	5
Scholarships and support.....	5
Curriculum of the Bachelor of Science (Honours) Degree in Geography and Environment	7
1. Programme at a glance.....	8
2. Programme Educational Objectives (PEOs)	8
3. Programme Learning Outcomes (PLOs).....	9
4. Graduate Profile/Attributes.....	9
5. Duration of the Programme and Total Credit Hours.....	11
6. Medium of Instruction and Assessment.....	11
7. Course and Credit-wise Notional (contact and non-contact) Hours.....	11
8. Semester Breakdown by Activities	12
9. Course Category and Distribution	12
10. Semester-wise distribution of courses	13
11. Assessment and Mark Distribution.....	15
(a) Distribution of marks for theory courses:	15
(b) Distribution of marks for practical courses:	14
(c) Distribution of marks for fieldwork courses:	16
12. Attendance	16
13. In-course Examination	16
14. Attending Semester End (Final) Examination.....	17
15. Classroom Rules of Conduct.....	17
16. Academic Integrity and Artificial Intelligence (AI) Use Policy.....	17
17. The Grading System	18
18. Promotion	18
19. Degree Requirements.....	18
20. Improvement of Grades	18
21. Re-admission	19
22. Dean's Award	19

The University of Dhaka

The University of Dhaka, the top-ranked university in Bangladesh, began its academic journey on 1 July 1921 under the leadership of its first Vice-Chancellor, Sir P. J. Hartog. Established on approximately 600 acres in the scenic Ramna area of the city, the University initially started with 3 faculties, 12 departments, 60 teachers, 877 students, and 3 residential halls. Over the years, the University has expanded significantly and now comprises 13 faculties, 83 departments, 12 institutes, 20 residential halls, 3 hostels, and more than 56 research centres. The student and faculty population has grown to around 37,000 students and nearly 2,000 teachers. Since its inception, the University has been committed to creating new knowledge and disseminating it to society. It has developed a strong academic tradition, supported by distinguished scholars whose contributions to teaching and research have enriched both national and global knowledge systems.

Vision of the University

The vision of the University of Dhaka is to create a world-class educational ecosystem that enables individuals to act as dynamic human capital and ethical leaders for a sustainable future.

Mission of the University (UM)

Mission	Title	Description
UM 1	Transformative Education	Provide transformative education by enabling students to embrace lifelong learning and fostering a sustainable knowledge-based society through the continuous pursuit of scholarship, humanistic values, and technological innovation.
UM 2	Collaborative Research and Innovation	Pursue collaborative research and innovation, leveraging partnerships to expand the boundaries of knowledge.
UM 3	Educational Ecology	Develop an educational ecosystem that fosters excellence, transparency, inclusivity, and accountability.
UM 4	Community Engagement	Engage with stakeholders and communities to build a just, fair, diverse, and sustainable world.
UM 5	Ethical Responsibility	Encourage students to become ethically responsible global citizens with a positive societal impact.
UM 6	National Heritage	Instil a deep sense of national heritage and pride in students, upholding historical roots and global connectivity.

Department of Geography and Environment

The Department of Geography and Environment is one of the oldest and most renowned departments at the University of Dhaka. Intending to develop a philosophical understanding of human-environment interaction in a spatio-temporal context, the Department of Geography began its journey in 1948 under the Faculty of Science at the Curzon Hall premises, with the endeavour of Professor Dr Nafis Ahmad. Since October 1965, the Department has been located at Qazi Motahar Hossain Bhaban. Later, to accommodate a broader spectrum of geographical knowledge, blending global and local environmental dimensions, the Department was renamed as the Department of Geography and Environment in 1996. Since July 2008, the Department has been continuing its academic journey under the Faculty of Earth and Environmental Sciences.

Vision of the Department

The vision of the Department of Geography and Environment, University of Dhaka, is to contribute to the nation through high-quality geography and environmental education and research; to continue its journey as a center of excellence in international research; and to produce world class graduates with a strong research orientation and high competence in achieving sustainable management of natural and human environment in the context of national visionary targets and Sustainable Development Goals (SDGs).

Mission of the Department

- GE M1 Produce highly competent, ethical, and socially responsible graduates** through quality teaching, learning, and research environments, while nurturing leadership, teamwork, and time management skills.
- GE M2 Advance impactful research and knowledge generation** on pressing spatial and environmental issues by fostering collaborations and providing logistics, with a focus on national priorities and global relevance.
- GE M3 Contribute to society and policymaking** by promoting professional competence, ethical responsibility, community engagement, advocacy and evidence-based planning at local, national, and global levels in a manner that directly aligns with the Sustainable Development Goals (SDGs).

Academic Programmes

The Department offers the following academic programmes.

- (a) Bachelor of Science (B.S.) in Geography and Environment (4 years)
- (b) Master of Science (M.S.) in Geography and Environment (1 year)
- (c) MPhil in Geography and Environment (2 years)
- (d) PhD in Geography and Environment (3 years)
- (e) Professional Master's in Environmental Planning, Management, and Sustainable Development (PMEPMSD) (1.5 years)

The Bachelor of Science (B.S.) in Geography and Environment is a four-year program that provides a comprehensive foundation in physical and human geography, geospatial techniques, and environmental management. The one-year M.S. programme provides specialisation in three streams, Physical Geography and Environment, Human Geography and Environment, and Urban and Regional Planning and Development, with both thesis and non-thesis options. The Department offers MPhil and PhD degrees focused on high-level original research aimed at addressing critical global and regional challenges. These advanced programmes provide opportunities for in-depth investigation into key areas such as physical geography, human geography, and urban and regional planning. Research themes include climate change, environmental sustainability, natural resource management, urbanisation, spatial inequality, disaster risk reduction, and geospatial analysis. The programmes promote interdisciplinary approaches and prepare students for research, policy, and professional practice. In addition to its regular academic programmes, the Department has been offering a 1.5-year Professional Master's in Environmental Planning, Management, and Sustainable Development (PMEPMSD), aimed at equipping professionals with specialised knowledge in environmental management from a geographical perspective.

Academic and Research Facilities

The Department has six research laboratories (Physical Geography Laboratory, Environmental Laboratory, GIS Laboratory, Remote Sensing Laboratory, Cartography Laboratory, and the Urban Studio) and houses a specialised research centre. These facilities are equipped with modern instruments, software, and analytical tools to support both teaching and research. The laboratories enable students and researchers to conduct practical work, spatial analysis, environmental assessment, and field data processing, thereby facilitating comprehensive and advanced research in geography and environmental studies.

Sirajul Islam Chowdhury Cartography Laboratory

The Cartography Laboratory (CL) is one of the oldest laboratories in the department. It is well equipped with the instruments required for geomatic surveying and various cartographic activities that support students' practical learning. The lab includes facilities for automatic level surveying, total station surveying, laser distance measurement, and drone surveys. It is the only geography laboratory in Bangladesh with a dedicated drone survey facility. The lab also houses a valuable collection of historical maps, portable GPS devices, hard and soft copies of topographic sheets

covering Bangladesh, traditional surveying instruments (such as plane tables, chains, and tapes), and various cartographic tools.

Prof. Dr. M. Maniruzzaman Miah Physical Geography Laboratory

The Physical Geography Laboratory (PGL) is dedicated to practical work in physical geography and environmental studies. It is equipped with instruments for analysing soil and water properties, rocks and minerals, drainage morphometry, flood frequency, and microfossils. The lab has a large number of binocular and stereomicroscopes for detailed analysis. It is one of the few laboratories in Bangladesh with facilities for studying foraminifera, pollen, and diatoms. Additional equipment includes augers, drilling tools, laser distance meters, measuring wheels, slope meters, and river survey instruments such as water samplers and Van Veen grab samplers.

Prof. Dr. K. B. Sajjadur Rasheed Environmental Laboratory

The Environmental Laboratory is equipped with instruments and chemicals for practical classes on soil, air, and water quality at both undergraduate and postgraduate levels. It is also used by faculty members and research students for advanced environmental research. The lab includes portable instruments for field testing of environmental parameters such as pH, salinity, total dissolved solids (TDS), and dissolved oxygen (DO). It also has facilities such as a spectrophotometer, air quality analyser, and a water distillation plant.

Prof. Dr. Rosie Majid Ahsan GIS Laboratory

The GIS Laboratory is one of the pioneering GIS facilities in Bangladesh. It is equipped with over 50 high-performance workstations. The lab supports a wide range of GIS software, including licensed versions of ArcGIS. It is currently being upgraded to include web-based GIS systems and ArcGIS Pro. The lab provides a conducive environment for GIS classes from undergraduate to postgraduate levels. It also occasionally offers professional certificate courses in GIS and its applications for participants both within and outside the department.

Remote Sensing (RS) Laboratory

Established in 2021, the Remote Sensing Laboratory is a modern facility equipped with around 40 high-performance computers capable of handling advanced remote sensing tasks. The lab includes software such as ERDAS Imagine, ArcMap, QGIS, and iDesktopX. Within a short time, it has developed into a centre for research on geospatial and environmental issues. The lab has also signed a Memorandum of Understanding (MoU) with SuperMap, enabling students to access advanced tools for big data analysis, 3D analysis, and augmented reality applications. It also hosts a research cluster that supports ongoing geospatial research.

Prof. Nazrul Islam Urban Studio

The Urban Studio is a specialised research space focused on urban issues. Unlike other laboratories, it functions as a research hub for students interested in urban studies and is also used for practical classes in the urban stream. Established in 2012, the studio aims to promote research on urban and environmental challenges and to provide training in urban planning, development, and management. It regularly organises seminars and symposia featuring national and international experts in urbanisation and development.

Disaster Research Training and Management Centre (DRTMC)

The Department houses the Disaster Research Training and Management Centre (DRTMC), which was established in 1989 to contribute to such information and knowledge creation and

archiving requirements. By being an interdisciplinary forum for research into the causes of disaster, the needs created by different disasters, the appropriate response strategies, the effect of the short and long-term disaster upon population, economics and environments and overall management strategies for different types of disaster, the Centre has become an important research focal point. This Center undertakes provides an array of training and extension programs in disaster management, mitigation, rehabilitation and reconstruction. It also regularly publishes a biannual newsletter titled *Durjog Barta*.

In addition to its laboratories and research centres, the Department hosts the headquarters of the Bangladesh Geographical Society (BGS). The Society plays a significant role in promoting geographical scholarship and professional engagement. It has been publishing the biannual journal *The Oriental Geographer* since 1957, along with an annual Bengali journal, *Bugol o Poribesh Potrika* (Journal of Geography and Environment), since 2001. These publications provide important platforms for disseminating research in geography and related fields.

Extracurricular Activities

The Department has a strong tradition of participation and achievement in sports and games, with students regularly competing in intra- and inter-university events. It has a notable record in football, becoming inter-department champions in 1997, 1998, and 2004, and runners-up in 2008. In cricket, the Department secured the championship in 2014 and was runner-up in 2012.

The Department is also a pioneer in environmental engagement, having established the Environment Club in 2013. The Club organises the National Environmental Olympiad (NEO) on World Environment Day with support from various organisations. In addition, the GeoEnv Career Club supports students in developing career skills and preparing for professional opportunities.

Scholarships and support

The Department provides a range of scholarships, financial assistance, and academic support to encourage excellence and promote inclusivity. It administers several Trust Funds that offer awards and stipends to top-ranking students in recognition of their outstanding academic performance. In addition, financial support is extended to meritorious students from economically disadvantaged backgrounds to ensure that financial constraints do not hinder their education. These initiatives aim to motivate students, foster academic achievement, and create equal opportunities for all learners to succeed. A list of scholarships offered by the department is given below:

Undergraduate Program

- Professor Zohra Yousuf Trust Fund Scholarship (Number: 2)
- Anjuman Dilara Scholarship (Number: 5)

Postgraduate Program

- Faizunnessa Khabiruddin Rahmani Memorial Foundation Gold Medal (Number: 1)
- Faizunnessa Khabiruddin Rahmani Memorial Foundation Scholarship (Number: 3)
- Siraj Majeda Smiriti Trust Fund Scholarship (Number: 3)

Others

- Geography & Environment Student Welfare Fund Scholarship (Number: 10)

- Department of Geography and Environment Alumni Scholarship (Number: 4)
- A. Q. M. Mohiuddin Memorial Scholarship (Number: 2)

Curriculum of the Bachelor of Science (Honours) Degree in Geography and Environment

Academic session: 2024-25

A. Programme Introduction

1. Programme at a glance

Programme /Degree title	: Bachelor of Science (B.S.) with Honours in Geography and Environment
Offering entity (Department)	: Geography and Environment
Faculty	: Earth and Environmental Sciences
Awarding University	: University of Dhaka
Duration	: 4 years (8 semesters)
Credits	: 147
BNQF Code	: 0532
Mode of study	: Full-time
Medium of study	: English
Applicable session(s)	: 2024-25

2. Programme Educational Objectives (PEOs)

The educational objectives of the programme are to

- PEO 1:** Develop a comprehensive understanding of physical and social environmental systems, including the spatial relationships between/among people, place, and environment.
- PEO 2:** Provide insights into the interactions between human communities, their cultures and traditions, and surrounding environments.
- PEO 3:** Build the capacity to analyse complex human–environment relationships, particularly in the context of resource use, environmental planning, and management.
- PEO 4:** Introduce and develop proficiency in the use of appropriate tools and techniques in both field and laboratory settings for geographical and environmental analysis.
- PEO 5:** Foster a research-oriented mindset for critically analysing cause–and–effect relationships among geographical processes, environmental parameters and socio-cultural contexts.
- PEO 6:** Enable students to apply geographical knowledge to understand and address environmental and societal challenges.
- PEO 7:** Encourage and prepare students for higher studies and research to further enhance their academic and professional competence.

3. Programme Learning Outcomes (PLOs)

The undergraduate programme in Geography and Environment is designed to ensure a comprehensive and balanced intellectual development of students. The Programme Learning Outcomes (PLOs) covers four key domains: Knowledge and Understanding, Analytical and Critical Thinking Skills, Technical and Applied Skills, and Professional Values and Personal Growth. These outcomes reflect the programme's commitment to developing well-rounded graduates equipped to address complex geographical and environmental challenges in academic, professional, and policy contexts.

Knowledge and Understanding

- PLO 1:** Demonstrate a comprehensive understanding of the theoretical foundations, evolution, and contemporary approaches of Geography and Environment within the broader context of earth and social sciences.
- PLO 2:** Acquire integrated knowledge of physical and human environmental systems and their interrelationships not only across multiple spatial and temporal scales but also in different contextual settings.
- PLO 3:** Develop interdisciplinary awareness by engaging with related fields of earth and environmental sciences, social sciences, and urban and regional planning, etc.

Analytical and Critical Thinking Skills

- PLO 4:** Critically analyse human–environment interactions (HEI), particularly natural resource use, environmental change, urbanisation, spatial (in)justice, and sustainability challenges.
- PLO 5:** Assess complex spatial, environmental and development challenges using scientific reasoning and propose context-specific, evidence-based solutions for planning and management.

Technical and Applied Skills

- PLO 6:** Apply modern geographical tools and techniques, including cartography, GIS, RS, surveying, environmental analysis and quantitative and qualitative research approaches.
- PLO 7:** Demonstrate practical competence in applying geographical and environmental knowledge in areas such as urban and regional planning, disaster risk management, environmental impact assessment, and climate change mitigation and adaptation.
- PLO 8:** Interpret and apply relevant policies, plans, and regulatory frameworks in addressing environmental and development issues at different levels (local, national and global).

Professional Values and Personal Growth

- PLO 9:** Exhibit professional skills and ethics, effective communication, teamwork, and social responsibility in addressing environmental and societal challenges and in advancing the country's sustainable progress.
- PLO 10:** Show commitment to lifelong learning, with the ability to pursue higher studies, research, and professional advancement in Geography and Environment.

4. Graduate Profile/Attributes

The following graduate attributes describe the key attitudes, values, and professional qualities expected of graduates of the Bachelor of Science (B.S.) in Geography and Environment at the University of Dhaka.

Attribute 1: Disciplinary Knowledge and Intellectual Capacity

Demonstrate strong and integrated knowledge of physical and human geography, environmental systems, and spatial analysis, along with the intellectual ability to understand, interpret, and critically engage with complex geographical and environmental issues.

Attribute 2: Leadership and Teamwork

Exhibit the ability to lead, collaborate, and work effectively in multidisciplinary teams, particularly in field-based and project-oriented environments.

Attribute 3: Critical and Reflective Thinking

Apply analytical, critical, and reflective thinking to understand, evaluate, and respond to complex geographical and environmental issues from multiple perspectives.

Attribute 4: Time Management and Discipline

Demonstrate the ability to manage time efficiently, meet deadlines, and balance academic, fieldwork, and professional responsibilities in a structured manner.

Attribute 5: Ethical and Professional Responsibility

Demonstrate integrity, honesty, and accountability in academic, research, and professional work, while adhering to ethical standards and maintaining discipline in all activities.

Attribute 6: Environmental and Social Commitment

Show a strong commitment to environmental sustainability and responsible resource management, along with sensitivity to social diversity, equity, and the complexities of urban and rural development and planning.

Attribute 7: Progressive Learning and Adaptability

Show a commitment to continuous learning, adaptability, and professional development to effectively address emerging challenges in geography, environment, and sustainable development.

B. Structure of the Curriculum

5. Duration of the Programme and Total Credit Hours

Duration: Eight (08) Academic Semesters in Four (04) Academic Years.

Total credit hours: 147

6. Medium of Instruction and Assessment

The medium of instruction and assessment for the Bachelor of Science (B.S.) in Geography and Environment at the University of Dhaka is English. All lectures, course materials, assignments, presentations, examinations, and academic communications are conducted in English to ensure consistency and academic rigour. Students are therefore expected to develop and demonstrate proficiency in English for effective participation in coursework, fieldwork, and research activities. This policy also aims to align the programme with international academic standards and enhance graduates' capacity for higher studies and professional engagement in both national and global contexts.

7. Course and Credit-wise Notional (contact and non-contact) Hours

The credit system is used to measure and enhance student learning. The Bangladesh National Qualifications Framework (BNQF) serves as the guiding document for the credit system in Bangladesh. In this system, credit is used as the unit for measuring students' academic workload, including all academic activities that contribute to the achievement of learning outcomes. The calculation of credit is based on notional hours, which represent the estimated time required for an average student to achieve the specified learning outcomes of a program or course.

Table: Academic activities and notional hours

No.	Learning-teaching Activities	Notional Hours for 1 Credit
1.	Lecture, Tutorial, Seminar	40
2.	Lab, Studio or Clinical Work	60
3.	Industrial/Workplace Learning	80

***(For lecture, tutorial, seminar 1-hour face to face learning per week for 14 weeks, for lab, studio or clinical work 1.5-hour face to face learning and Industrial/Workplace Learning 2 hours per week for 14 weeks is equivalent to 1 credit)**

The proposed notional hours for each of the learning activities include assessment, self-learning and preparatory work.

Table: Course and Credit-wise Hours distribution

Credits	Course Type	Contact Hour (Face to Face)	Non-Contact Hour (1.85 of Contact)	Total hour
2	Theory	28	52	80
	Practical/Lab	42	78	120
	Fieldwork	56	104	160
3	Theory	42	78	120
	Practical/Lab	63	117	180
	Fieldwork	84	156	240

8. Semester Breakdown by Activities

The academic calendar for each semester spans a total of 26 weeks, ensuring a balanced distribution of instructional and assessment activities. It includes 14 weeks of regular classes followed by 2 weeks allocated for the in-course examination and presentation. A 2-week preparatory leave is provided to support students' exam readiness, followed by a 6-week period for semester-final examinations. Additionally, a 2-week vacation is scheduled at the end of the semester, offering students a period of rest before the next academic cycle begins.

Table: Semester activities and allocated time

Activities	Allocated time (in weeks)
Classes	14 weeks
In-course Examination/ Presentation	2 weeks
Final Exam Preparatory leave	2 weeks
Semester final exam	6 weeks
Vacations	2 weeks
Total	26 weeks

9. Course Category and Distribution

The curriculum is structured into several integrated course categories to ensure a comprehensive academic foundation. The **General Education Courses (GED)** component encompasses a balanced selection of courses across Arts and Humanities, Social Sciences, ICT, and Basic Science, designed to provide interdisciplinary knowledge and essential skills. The **Core Courses** form the central focus of the program, comprising Major/Departmental courses that include theory, laboratory work, and fieldwork, alongside **Minor or aligned courses** that complement the main discipline. Notably, the program does not offer any Optional or Elective courses, as all prescribed courses are compulsory to maintain academic rigour and coherence. In addition, **Tutorials and Viva** are incorporated to support continuous assessment, critical engagement, and in-depth understanding of the subject matter. The distribution of credits across different course types and different years is shown below.

Table: Breakdown of the total credits into course types

Course types	Total Credits	Percentage
General Education Courses	20	13.61%
Core Courses	107	72.79%
Minor or Aligned Courses	12	8.16%
Tutorial and Viva voce	8	5.44%
Total	147	100.00%

Table: Breakdown of the total credits by mode of teaching and distribution by year

Course types	Year 1	Year 2	Year 3	Year 4	Total credits	% of total credits
Theory	18	24	24	27	93	63.27%
Practical/Lab	11	7	10	7	35	23.81%
Fieldwork	2	3	3	3	11	7.48%
Viva voce	2	2	2	2	8	5.44%
Total	33	36	39	39	147	100.00%

10. Semester-wise distribution of courses

The following table presents the semester-wise list of courses, with detailed descriptions provided in Section C (Page 20).

Course code	Course title	Credit	Course type
Year: 1st	Semester: 1st		
GETh 101	Fundamental Concepts in Geography and Environment	3	CCT
GETh 102	Introduction to Physical Geography and Environment	3	CCT
GETh 103	Introduction to Human Geography and Environment	3	CCT
GEDTh 104	Fundamentals of Economics	3	GEDT
GELb 105	Cartography and Map Projection	3	CCL
Total credit hours		15	
Year: 1st	Semester: 2nd		
GETh 106	Region and World Regional Pattern	3	CCT
GETh 107	Biogeography	3	CCT
GEATh 108	Fundamentals of Anthropology	3	ACT
GELb 109	Topography and Geomatic Surveying	3	CCL
GEDLb 110	Fundamentals of Computer	2	GEDL
GELb 111	Introduction to Research and Fieldwork in Geography and Environment	2	CCF
GEV 112	Viva voce	2	VV
Total credit hours		18	

Year: 2nd	Semester: 3rd		
GETh 201	Geomorphology	3	CCT
GETh 202	Economic Geography	3	CCT
GEATh 203	Introduction to Soil Science	3	ACT
GEATh 204	Fundamentals of Geology	3	ACT
GEDLb 205	Fundamentals of Programming	3	GEDL
GELb 206	Fundamentals of GIS and Computer Cartography	2	CCL
Total credit hours		17	

Year: 2nd	Semester: 4th		
GETh 207	Cultural Geography	3	CCT
GETh 208	Geography of Natural Resources	3	CCT
GEDTh 209	Fundamentals of Sociology	3	GEDT
GEDTh 210	Fundamentals of Statistics	3	GEDT
GELb 211	Fundamentals of Remote Sensing	2	CCL
GELb 212	Research Methods and Fieldwork in Human Geography and Environment	3	CCF
GEV 213	Viva Voce	2	VV
Total credit hours		19	

Year: 3rd	Semester: 5th		
GETh 301	Thoughts and Concepts in Geography and Environment	3	CCT
GETh 302	Population Geography	3	CCT
GEDTh 303	Fundamentals of Chemistry	3	GEDT
GETh 304	Rural Geography and Settlements	3	CCT
GEDLb 305	Application of Statistics in Geography and Environment	2	CCL
GELb 306	GIS: Advanced Data Concepts and Spatial Analysis	2	CCL
GELb 307	Map Reading and Interpretation	3	CCL
Total credit hours		19	

Year: 3rd	Semester: 6th		
GETh 308	Bangladesh: Geography and Environment	3	CCT
GETh 309	Climatology	3	CCT
GETh 310	Coastal Geography and Environment	3	CCT
GETh 311	Hazard and Disaster Management	3	CCT
GELb 312	Remote Sensing: Image Processing and Analysis	3	CCL
GELb 313	Research and Fieldwork in Physical Geography and Environment	3	CCF
GEV 314	Viva Voce	2	VV
Total credit hours		20	

Year: 4th	Semester: 7th		
GEDTh 401	Advanced Research Methodology	3	GEDT
GETh 402	Ocean and Marine Environment	3	CCT
GETh 403	Urban Geography	3	CCT
GETh 404	Agricultural Geography	3	CCT
GETh 405	Environmental Planning and Management	3	CCT
GELb 406	Application of GIS and Remote Sensing	3	CCL
Total credit hours		18	

Year: 4th	Semester: 8th		
GETh 407	Political Geography	3	CCT
GETh 408	Transport Geography	3	CCT
GETh 409	Regional Geography of South Asia	3	CCT
GEATh 410	Fundamentals of Spatial Planning	3	ACT
GELb 411	Techniques in Physical Geography	2	CCL
GELb 412	Environmental Analysis	2	CCL
GELb 413	Landuse Survey	3	CCF
GEV 414	Viva Voce	2	VV
Total credit hours		21	

ACT = Aligned/ Minor Course – Theory
 CCT = Core course – Theory
 CCL = Core course – Lab/ Practical
 CCF = Core course – Fieldwork
 GEDT = General Education Course – Theory
 GEDL = General Education Course – Lab/ Practical
 VV = Viva-voce

11. Assessment and Mark Distribution

(a) Distribution of marks for theory courses:

Items	2 Credit	3 or 4 credit
Attendance	2.5	5
Tutorial	5	10
In-course and Assignment	7.5	15
Course final examination	35	70
Total Marks	50	100

(b) Distribution of marks for practical courses:

Items	2 Credit	3 or 4 credit
Attendance	2.5	5
Lab work and Assignment	17.5	35
Course final examination	30	60
Total Marks	50	100

(c) Distribution of marks for fieldwork courses:

	Items	2 Credit	3 Credit
Continuous Internal Evaluation	Attendance	5	10
	Field performance	7.5	15
	Field viva	7.5	15
Summative Evaluation	Field report	20	40
	Presentation	10	20
Total Marks		50	100

12. Attendance

All students are expected to attend every class. and actively participate during discussion sessions. Attendance marks are allocated across all three types of courses. The distribution of marks for attendance is structured as follows:

Attendance (in %)	Marks (%of course total)
95 to 100	10
90 to 94	9
85 to 89	8
80 to 84	7
75 to 79	6
70 to 74	5
65 to 69	4
60 to 64	2
Less than 60	0

Attendance is also related to the eligibility to sit for the Semester End Examination. Eligibility of the student for the final examination will be decided based on the percentage of the student's attendance for all courses in an academic semester.

Aggregated attendance (%)	Category	Eligibility
75% and above	Collegiate	Eligible for the final exam
60% to less than 75%	Non-collegiate	Eligible for the final exam with payment of fines
Less than 60%	Dis-collegiate	Not eligible

13. In-course Examination

The concerned examination committee, with the approval from the Academic Committee, will schedule the in-course examinations, and the dates will be announced in advance. These examinations will be conducted only for theory courses. The course teacher will inform students beforehand about the question pattern and mark distribution. Students are required to attend the examination on the scheduled date. Make-up examinations will not be permitted, except in exceptional circumstances supported by valid evidence. The course teacher will have the sole authority to approve such cases.

14. Attending Semester End (Final) Examination

To be eligible to attend semester-final examinations, a student must meet the minimum class attendance requirement (as described in Section 12), complete the prescribed form fill-up process set by the Controller of Examinations, and clear all required dues. Upon fulfilling these requirements, an Admit Card will be issued prior to the examination, which must be presented in the examination hall to be allowed to sit for the exam.

15. Classroom Rules of Conduct

- Students are expected to attend all classes regularly and arrive on time.
- Active and respectful participation and engagement in class activities are encouraged.
- Mobile phones and other electronic devices should be switched off or kept in silent mode during class.
- The use of electronic devices is strictly prohibited during examinations.
- All assignments, coursework, and submissions must be completed within the specified deadlines.
- Academic integrity must always be maintained; any form of plagiarism or misconduct is unacceptable.
- Students must show respect and courtesy to teachers, instructors, staff, and fellow classmates.
- A positive, inclusive, and distraction-free learning environment should be maintained by all.

16. Academic Integrity and Artificial Intelligence (AI) Use Policy

The Department upholds strict standards of academic integrity to ensure that all coursework and research reflect students' original work, critical thinking, and proper scholarly practice. In alignment with the University's regulations, the Department has established specific policies and guidelines on academic integrity and AI usage, and all students are required to comply fully with these regulations. Failure to comply with these guidelines will be considered a violation of academic integrity policies.

Plagiarism and Similarity Index

The Department of Geography and Environment strictly adheres to the well-established academic integrity regulations of the University of Dhaka. One of the major clauses of the regulation is the threshold of the similarity index. For any thesis or project report, or written assignment, the **maximum allowable Similarity Index is 20%**.

Artificial Intelligence (AI) Usage

In accordance with the decision of the Deans' Committee, the following guidelines apply to the use of Generative AI in academic work:

- (a) Students must submit a mandatory AI disclosure statement with their thesis or project report, using the format prescribed by the Department/Examination Committee.
- (b) The use of Generative AI for creating images, tables, graphs, or datasets is strictly prohibited.
- (c) The total **AI-generated content in any document must not exceed 30%**. In critical sections or writings, such as **research proposals and analytical discussions, AI-generated content must be limited to a maximum of 10%**.

17. The Grading System

As mentioned earlier in Section 11, each 3/4-credit-hour course will include 100 Marks, and 2 credit courses will include 50 Marks for numerical evaluation. Total marks obtained by a student will be finally converted into Letter Grades and Grade Points following the standard scale of the University as follows:

Marks Obtained (%)	Letter Grade	Grade Point
80-100	A+	4
75-79	A	3.75
70-74	A-	3.5
65-69	B+	3.25
60-64	B	3
55-59	B-	2.75
50-54	C+	2.5
45-49	C	2.25
40-44	D	2
<40	F	0
I	Incomplete	
W	Withdrawn	

18. Promotion

Promotion is year-wise. Consequently, promotion from one semester to the next consecutive semester within a year (1st semester to 2nd semester, 3rd semester to 4th semester, 5th semester to 6th semester, 7th semester to 8th semester) is automatic. For promotion from one class year to the next class year, a student is required to obtain a minimum CGPA (Cumulative Grade Point Average) of 2.00, which is as:

Class Year	Minimum CGPA in the following years
From First Year to Second Year	2.00
From Second Year to Third Year	2.00
From Third Year to Fourth Year	2.00

19. Degree Requirements

To obtain the B.S. (Honours) degree in Geography and Environment, a student must successfully complete a total of 147 credit hours without receiving an 'F' grade in any course and achieve a minimum CGPA of 2.00 within a maximum period of six consecutive years from initial admission. To appear in each semester's final examination, each student has to complete the form fill-up process as set by the Controller of Examinations on payment of all dues.

20. Improvement of Grades

A student obtaining an 'F' grade in any course will not be awarded the degree. A student with an 'F' grade in any course shall be allowed to improve twice/two times only with the following batches. For the in-course examination and *viva vocé*, no improvement is allowed. A student obtaining less than 3.00 grade points in any course may improve the grade by appearing at the year's final

examination with the following two batches but not more than one time, subject to prior permission from the Department at least three weeks before the final examination starts. In such cases, only the better result will be considered.

21. Re-admission

Any student failing to earn the required GPA in any year's final examination may apply for re-admission with the following batches. In such a case, all in-course marks/grades obtained earlier by a student shall be cancelled, and the student shall have to retake all in-course and final examinations. Re-admission shall be allowed only once in a class and not more than twice during the entire program.

22. Dean's Award

Students who obtain a CGPA of 3.75 or above, without any course improvement, F' grade, or academic loss during the four-year programme, and who maintain at least 90% attendance, shall be eligible for the Dean's Award.

C. Course Details

Course Code	: GETH 101
Course Name	: Fundamental Concepts in Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Geography is a bridge between the human and physical sciences. As a systematic discipline, Geography and Environment provides a clear understanding of the Universe and its features. The students are expected to learn about the basics of human and physical geographies and how they support each other while describing any geographical phenomena, emphasising man and environment interactions.

Course Objectives

1. Enhance students' understanding of the development of geographical thought and ideas.
2. Introduce the concept of **man-environment interaction** as the discipline's fundamental theme.
3. Provide a working knowledge of the **fundamental concepts** that define all geographic phenomena (e.g., Location, Space, Region).
4. Familiarise students with the **historical evolution** of geographical thought from ancient times to the present.
5. Enable students to distinguish and apply the **major philosophical themes** (Earth Science, Spatial, and Regional) in modern geographic study.

Course Learning Outcomes (CLOs)

1. Understand the basics such as subject matter and branches, scope, purpose and methods of geography and environment.
2. Get an idea of the brief development history of geographical thoughts and concepts, along with major themes of geography and environment
3. Apply the fundamental spatial concepts (Location, Distribution, Region, Interaction) to describe and analyse geographical phenomena
4. Differentiate between the major philosophical views (Earth-Science, Man-Environment, Spatial, and Regional) that frame geographical inquiry
5. Explain the role of Geography and Environment as a synthetic, interdisciplinary science that connects physical and human systems

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Geography and Environment: Definition, subject matter and branches of Geography, Geography as a discipline: Geography as a science, Geography as a social science, The context of Environment in Geography, Purpose, Scope and Methods of Geography and Environment	6	1,5

2	Fundamental Concepts in Geography: Location, Distribution and Agglomeration, Process, Interaction and Pattern, Place, Space and Time, Shape, Size and Distance, Thesis, Anti-thesis and Synthesis, Region and Regionalisation	9	3
3	Development of Geographical Ideas and Concepts: (Brief History of the Development of Geographical Knowledge and Concepts) Ancient Period, Greek and Roman Classical Period, Middle Ages and Renaissance, Muslim Periods, Chinese and Indian Geography in the ancient and Middle Ages	15	2
4	Major Views and Themes in Geography and Environment: Earth-Science View, Man-Environment View, Regional View, Spatial Organisation View, Behavioural View, Ecological View	12	4,5

Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Martin, G. J. (2005). *All Possible Worlds: A History of Geographical Ideas* (4th ed.). Oxford University Press.
- Cresswell, T. (2024). *Geographic thought: A critical introduction*. John Wiley & Sons.
- Majid, H. (2015). *Evolution of Geographical Thought* (6th ed.). Rawat Publications.
- Holden, J. (2017). *An Introduction to Physical Geography and Environment* (4th ed.). Pearson Education Limited.
- Fouberg, E. H., Murphy, A. B., & de Blij, H. J. (2015). *Human geography: people, place, and culture*. John Wiley & Sons.
- Chorley, R. J., & Haggett, P. (Eds.). (1967). *Models in Geography*. Methuen.
- Rhoads, M. (1967). *Introduction to Geography*. Rand McNally & Company.
- Barry, R. G., & Chorley, R. J. (2003). *Atmosphere, Weather and Climate* (8th ed.). Routledge.
- Arbogast, A. F. (2017). *Discovering physical geography*. John Wiley & Sons.
- Livingstone, D. N. (1992). *The geographical tradition: Episodes in the history of a contested enterprise*. Blackwell.
- Dohrs, F. E., & Sommers, L. M. (1969). *Introduction to Geography*. Crowell Company.
- Harvey, D. (1969). *Explanation in Geography*. Edward Arnold.
- Robinson, A. H. (1995). *Elements of cartography* (6th ed.). John Wiley & Sons.
- Kotsakis, C., & Tzioumas, G. (2014). *Geodesy: Introduction to geodetic datum and geodetic systems*. Springer.
- Nafis, A. (1981). *Muslim Contributions to Geography*. Sunwise Turn Ltd.

Course Code	: GETH 102
Course Name	: Introduction to Physical Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces students to the Earth's physical environment. Physical Geography is a fundamental course covering the formation and characteristics of the Earth's surface and its interior; the structure, composition, and properties of the lithosphere, atmosphere, hydrosphere, and biosphere; and the processes that drive Earth's physical systems.

Course Objectives

1. Describing and explaining the Earth's land surface, atmosphere, oceans and biosphere, and relating them to the dominant natural processes and changes over time.
2. Developing an impression of the complex inter-relationships inherent in Earth's natural systems.
3. Understanding the basics of land formation and the processes that shape the landscape.
4. Understanding the spatial distribution and dynamics of flora and fauna, and their ecological characteristics.

Course Learning Outcomes (CLOs)

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

1. Describe the fundamental concepts of physical geography, the physical environmental settings of the Earth, and the relationship between different spheres of the Earth.
2. Demonstrate/explain the origin, the internal structure of the Earth, endogenetic and exogenetic processes and formation of the Earth.
3. Categorise the broader concept of the Earth system and apply critical thinking skills in advanced study.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Physical Geography and Environment: Definition; subject matter; historical development; nature, scope and relation with other subjects	4.5	1
2	Earth as a Planet: Origin of the solar system and earth, shape and size; rotation and revolution; Geographic grid; world time zone	4.5	1, 2
3	Geological Time Scale: Definition, divisions and sub-divisions, emergence of plants and animals	4.5	1, 2
4	Earth's Structure: Internal structure of the Earth: Crust, Mantle, and Core; composition of the Earth's crust (SiAl/SiMa): rocks and minerals (Classification and Properties)	4.5	1, 2
5	Land forming Processes: Endogenic process (Volcanism,	6	1, 2

	Earthquakes); Exogenic process (River, Glacier, and Wind); weathering and erosion		
6	The Lithosphere: Different types of landforms; mountains, valleys, plateaus, deltas and deserts. global distribution, landscape ecology	4.5	1, 3
7	The Atmosphere: Composition and structure; weather and climate (factors and elements)	4.5	1, 3
8	The Hydrosphere: Global distribution of water (oceans, lakes, glaciers, rivers and wetlands); hydrological cycle	4.5	1, 3
9	The Biosphere: Definition; components; plant and animal kingdom. global distribution	4.5	1, 3

Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Gabler, R. E., Petersen, J. F., & Trapasso, L. M. (2007). *Essentials of Physical Geography (8th ed.)*. Thomson Brooks/Cole.
- Holden, J. (2017). *An introduction to Physical Geography & the Environment*. Pearson Education.
- Monkhouse, F. J. (1964). *The Principles of Physical Geography*. University of London Press.
- Robinson, H. (1974). *Physical Geography*. Mac Donald & Evans.
- Strahler, A. (2016). *Introducing Physical Geography*. Wiley India.
- Strahler, A. H., & Strahler, A. (2005). *Introducing Physical Geography (4th ed.)*. Wiley.

Course Code	: GETH 103
Course Name	: Introduction to Human Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a foundational understanding of Human Geography, focusing on the interplay between people, places, and environments. Key themes include population dynamics, cultural landscapes, economic systems, urbanisation, political territories, and human–environment interactions. Students will engage with both traditional and contemporary approaches, including environmental determinism and possibilism, spatial analysis, and key concepts of human geography, to understand the evolving nature of the field from local to global scales.

Course Objectives

1. Introduce the foundational concepts, approaches and scope of Human Geography, including the key terms of place, space, scale and landscape.
2. Examine population dynamics, migration patterns and urban development, with a focus on their global and local implications.
3. Teach theories of human-environment interactions and analyse their applications through real-world case studies.
4. Evaluate the impacts of globalisation and emerging challenges in Human Geography by emphasising planning and policy applications

Course Learning Outcomes (CLOs)

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

1. Define the core concepts and approaches of Human Geography, including the terms of place, space, scale and landscape.
2. Analyse the development and methods of Human Geography and their impact on culture and spatial dynamics.
3. Evaluate population dynamics, demographic models, migration patterns and related policies.
4. Examine the origins, diffusion and evolution of urban landscapes in developing regions.
5. Understand human-environment interactions through key theories and real-world case studies.
6. Explain the impacts of globalisation and apply geographic concepts to planning and policy challenges.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Human Geography: Definition, Approaches and Scope of Human Geography, Importance and Applications of Human Geography, Human Geography as a Multi-Disciplinary Discipline, Key Concepts of Place, Space, Scale, and Landscape and Perspectives in Human Geography	6	1

2	The Foundations of Human Geography: Development of Human Geography as a Discipline, Tools and Methods in Human Geography and Its Impact on Place and Culture	4.5	1,2
3	Population and Migration: Population Dynamics (Growth, Distribution and Density), Demographic Transition Model, Models of Population growth and Population Policies, Migration (Types, Causes, and Consequences), Concepts of Overpopulation and Under-population	7.5	3,4
4	Geographies of Culture and Landscape: World division by culture, Cultural landscapes, Cultural variables, Identity and difference	3	4
5	Human-Environment Interactions: Theories of human-environment interactions, Environmental Determinism, Possibilism, Cultural Ecology, Political Ecology, Human-Environmental System, case studies of human impacts	6	5
6	Uneven Development and Global Inequalities: Identifying global inequalities, Explaining global inequalities, Interpreting the significance of global inequalities	6	4,5
7	Geographies of Globalisation: Introducing Globalisation, Interpreting, Conceptualising, and Measuring	4.5	6
8	Human Geography in Practice: Applications of Human Geography in Planning and Policy, Emerging Trends and Future Challenges in Human Geography	4.5	6

Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Fouberg, E. H., Murphy, A. B., & de Blij, H. J. (2015). *Human geography: People, place, and culture* (11th ed.). Wiley.
- Knox, P. L., & Marston, S. A. (2016). *Human geography: Places and regions in global context* (7th ed.). Pearson.
- Norton, W. (2014). *Human geography* (8th ed.). Oxford University Press.
- Daniels, P., Bradshaw, M., Shaw, D., Sidaway, J., & Hall, T. (2016). *An introduction to human geography* (5th ed.). Pearson.

Course Code	: GEDTh 104
Course Name	: Fundamentals of Economics
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course introduces fundamental economic concepts, focusing on how individuals, businesses, and governments make choices in the face of scarcity to satisfy unlimited wants. This foundational course equips students with the knowledge to understand and analyse economic issues and their implications in the real world. It covers the following areas of Economics: Microeconomics - the analysis of choices made by individual decision-making units (households and firms); Macroeconomics - the analysis of the economy as a whole; Development and Planning – analysis of multidimensional aspects of development, and planning; and Economy of Bangladesh – analysis of socio-economic variables over the years.

Course Objectives

1. To give a clear idea about the fundamental economic problems and provide adequate knowledge for understanding basic economic theories and practices, and their implications in the economy
2. To provide students with an understanding of how the modern economy functions in the real world and thereby prepare them to evaluate the state-of-affairs of an economy using an economist's lens.
3. To enable students to apply their acquired knowledge in different stages of their professional career.

Course Learning Outcomes (CLOs)

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

1. Understand the nature of the discipline and consumer behaviour.
2. Explain key macroeconomic concepts to understand the overall performance of an economy.
3. Discuss the multifaceted aspects of development.
4. Assess implications of different economic policies and different planning issues for growth and development in the context of Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Microeconomics: Basic concepts of Economics: Scarcity, Choice and Opportunity Costs; Demand: The Law of Demand, the Demand Curve, Individual and Market Demand, factors affecting the Demand Curve, Shifts vs. Movement along the demand curve, Elastic and Inelastic Demand; Supply: Law of Supply, Supply Curve, factors affecting the Supply	12	1

	Curve, Shifts vs. Movement along the Supply Curve, Elasticity of Supply; Market Equilibrium: Interaction of Demand and Supply, effect of a shift in Demand or Supply or both, effect of a Tax or a Subsidy, Price Controls; Consumer Behavior: Utility and Choice, Marginal Utility, Diminishing Marginal Utility, Equimarginal Principle, Indifference Curves and their properties, Budget Sets, Equilibrium of the Consumer with Indifference Curves and Budget Sets, Income and Substitution Effects, Deriving the Demand Curve from the Indifference Curves and Budget Sets, Complements and Substitutes, Consumer Surplus		
2	Macroeconomics: Macroeconomic Variables: National Income, Employment, Interest and Price; Measuring the Total Activity of an economy: GDP, Real vs. Nominal GDP, Price Deflators; GDP and its components: Consumption, Investment, Government Expenditure, Net Exports; Macroeconomic Equilibrium: Aggregate Demand – Aggregate Supply Model; Money and its evolution	12	2
3	Development and Planning: Dimensions of Economic Development; Human Development Index; Sustainable Development Goals (SDGs); Project Evaluation: Net Present Value (NPV), Internal Rate of Return (IRR), Cost Benefit Analysis; Multidimensional Poverty Index (MPI); Fourth Industrial Revolution (4IR); Planning: Definition of Planning, Different Stages of Planning	9	3
4	Economy of Bangladesh: Brief profile of the Socioeconomic Status of Bangladesh; Population growth, labor force and its distribution, structure and composition of GDP, growth in GDP and Per Capita Income, macroeconomic change since independence; Fiscal sector: Budget and its structure, revenue: structure and growth, tax and non-tax revenue: structure and growth, expenditure: structure and trends, financing of the budget	9	4

Teaching Strategies and Activities

- Lecture with multimedia, Class participation, Interactive discussions/Group discussion/Team work, Group/Individual assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Hubbard, R. G., & O'Brien, A. P. (2024). *Economics* (9th ed.). Pearson.
- Todaro, P. M., & Smith, C. S. (2020). *Economic Development* (13th ed.). Pearson.
- Finance Division, Ministry of Finance, The Government of the People's Republic of Bangladesh (2025). *Bangladesh Economic Review*. <https://mof.gov.bd>
- Mankiw, N.G. (2024). *Principles of Economics* (10th ed.). Cengage Learning.

Course Code	: GELb 105
Course Name	: Cartography and Map Projection
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course emphasizes the design and production of both thematic and reference maps at multiple scales, using appropriate symbols and visual hierarchies to ensure effective communication of map content. However, particular emphasis will be placed on essential cartographic elements such as shape, size, map scales, coordinate systems, graticules, and map projections.

Course Objectives

1. Explain the fundamental concepts of cartography and compare different types of map projections based on their properties and uses.
2. Identify and apply essential map components to ensure accurate interpretation and effective map operation.
3. Use appropriate graphical and symbolic techniques to represent geographic data clearly and accurately.
4. Select and implement suitable thematic mapping to communicate spatial information effectively for various analytical purposes.

Course Learning Outcomes (CLOs)

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

1. Explain fundamental concepts and principles of cartography and spatial representation
2. Apply cartographic techniques to design and construct maps for effective spatial communication
3. Analyse and interpret spatial patterns and relationships using appropriate mapping methods
4. Evaluate and apply map projections and spatial referencing techniques for accurate representation.
5. Demonstrate creativity, precision, and professional responsibility in map design and presentation.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Cartography: Definition, History, Importance and Application	4.5	1
2	Maps and Scale: <i>Map:</i> Definition, History, Importance and uses of maps, Types, Basic elements of map; Scale: Definition, Types and Uses, Construction of scale (Linear, Comparative and Diagonal)	7.5	1,2

3	Enlargement and Reduction of Map, Combining map: Concept, Purpose, and Application, Methods of Enlargement and Reduction (Graphical: Square and Similar triangles), combining maps on different scales	6	2
4	Distance Measurement and Area Measurement: Concept and Types of Distance, Methods of Measurement, Conversion to Ground Distance, Methods of Area Measurement (Square method, Simpson's rule, Strip method), Accuracy and Errors	9	2
5	Map Design and Symbolology: Cartographic Design; Principles of map design; Principles for color thematic maps: Color Theory, Models and Perception; Typographic Map Production	7.5	1,2
6	Thematic map: Definition and Concept; Nature of Geographic Data and the selection of Thematic mapping, Techniques of Thematic Mapping- Choropleth, Isorhythmic, Dot, Flow, Proportional symbol, and Cartogram	12	3,4,5
7	Map Projection and Geo-referencing: Definition and Uses; Classification (Perspective, Non-perspective, Conventional, Cylindrical Conical Zenithal), Coordinate System, Geodetic Datum, Geodesy, Geoid	7.5	4,5
8	Construction of Various Projections (Graphical and Mathematical) along with their Merits and Demerits, Cylindrical Equal Area Projection, Mercator's Projection, Conical Projection, Bonne's Projection, and Zenithal Equal Area Projection	9	4,5

Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the formative assessment will be decided by the course teacher

Reading Materials

- Peterson, G. N. (2025). *GIS cartography: A guide to effective map design* (4th ed.). CRC Press.
- Markoski, B. (2018). *Basic Principles of Topography*, Springer Geography.
- Singh, G. (2009). *Map Work and Practical Geography*, Vikas Publishing House
- Dent, B. D., Torguson, J. S., & Hodler, T. W. (2009). *Cartography: Thematic map design* (6th ed.). McGraw-Hill.
- Singh, R.L. and Singh, R.P.B. (1979). *Elements of Practical Geography*, Kalyani Publishers

Course Code	: GETH 106
Course Name	: Region and World Regional Pattern
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course is an introduction to the region and regional geography basics. The world's major regions are seen through their defining physical, social, cultural, political and economic features. The regions are examined in terms of their physical and human characteristics and their interactions. The course emphasises the role of regions in the globalisation process.

Course Objectives

1. Expand students' general knowledge of the world by introducing them to the physical and human geography of world regions.
2. Recognise the forces of globalisation and assess its impacts.
3. Make aware of regional contributions to global pollution and climate change.
4. Gain an understanding of the importance of cities.

Course Learning Outcomes (CLOs)

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

1. Define and explain the geographic concept of "region" and its role in a globalising world.
2. Locate significant geographic features of regions of the world and describe their cultural, economic, political, and physical characteristics.
3. Utilise maps to understand locations of places, the connections between places, and spatial patterns and trends of cultural and physical phenomena on the earth.
4. Describe area and population patterns, important historical background, features that create regional unity or division, economic, urban, and agricultural patterns, and geopolitical issues that help define each of the world's regions.
5. Apply geographic concepts to understanding current events, conflicts, and issues in a regional context.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Region: Definitions, Types, Characteristics, World Regionalisation, Dynamic concepts	3	1
2	Regional Geography Basics: Issues of people and land, Political Freedom, Economic Inequality, Global Economy, Natural Environment, Human Development and Human Rights	6	2
3	Globalisation and World Regions: Concepts and Facets of Globalisation and Localisation, Major World Regions	12	3,4
4	World Physical Regions: Characteristics of Physical Regions, Climatic Region, Vegetation Region, Soil Region	12	4,5

5	World Human Regions: Characteristics of Humanistic Regions, Cultural Region, Economic Region, Urban Region, Population Region	12	5
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Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Bradshaw, M., White, G. W., & Chacko, E. (2004). *Contemporary World Regional Geography* (2nd ed.). McGraw-Hill.
- De Blij, H. J., & Muller, P. O. (2004). *Geography: Realms, Regions and Concepts* (11th ed.). John Wiley and Sons, Inc.
- Pulsipher, L. M., & Pulsipher, A. (2006). *World Regional Geography: Global Patterns, Local Lives* (3rd ed.). W. H. Freeman and Company.

Course Code	: GETH 107
Course Name	: Biogeography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Biogeography is the study of the geological, evolutionary, and ecological processes that have resulted in the geographic patterns of biodiversity that we see today. This course provides a comprehensive overview of this most fascinating subject. The study of biogeography is essential to synthesising large- and small-scale patterns of species' responses to global environmental change and provides a window to assess both the Earth's history and the evolutionary history of populations. We will explore the ecological, evolutionary, climatological, and paleontological foundations for the distribution of species and biological communities. The course will review relevant classic papers, the current synthesis of biogeographic theory, and the application of biogeography to conservation.

Course Objectives

The purpose of this course is to:

1. Provide knowledge to the students about the combined evolutionary and ecological perspectives in the field of biogeography.
2. Understand how Earth's history, contemporary environments, and evolutionary and ecological processes have shaped species distributions and nearly all patterns of biodiversity.
3. Describe and understand about earth's ecosystem, plants and animal kingdom.
4. Explore the major biomes of the world and their relationship with communities.

Course Learning Outcomes (CLOs)

After completion of the course, the students will be able to:

1. Explain the sciences of biogeography, including the spatial organisation of the biosphere and the influence of geography on life.
2. Identify and interpret key events in Earth's geological history (e.g., evolution, plate tectonics, geological time scale) and analyse their impacts on present-day biodiversity, including patterns of dispersal.
3. Describe and evaluate the concept of ecosystems and their key components and processes.
4. Analyse the distribution of plant and animal communities (biogeographic realms) and explain the mechanisms of their dispersal.
5. Classify and differentiate the Earth's major biomes based on their characteristics and geographic distribution.
6. Examine how the spatial and temporal dynamics of islands influence biodiversity patterns.
7. Assess and apply knowledge of biogeographic patterns and processes to understand the impacts of climate change on ecosystems and to address issues such as biodiversity conservation and environmental change from local to global scales.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Biogeography: Definition; History of biogeography- scope and development; Biogeographic patterns	6	1
2	Evolution, Niche, and the Geographic Range: Evolution and plate tectonics; Geologic time scale; Dispersal and colonisation; The ecological niche- distributions of species and extinction; Pleistocene biogeography and paleoecology	7.5	2
3	Geographical Distribution of Plants: Plant growth; Factors of plant dispersal; Types of distribution of plants; Floristic region; Plant succession (types, forms, stages)	6	4,7
4	Zoogeography: Animal dispersal and migration; Zoogeographical realms	4.5	4,7
5	Ecosystem: Definition and components; Classification, structure and components of ecosystems; Food chain and food web; Energy and mineral movement in ecosystems	6	3,7
6	Distribution and Dynamics of Communities and Biomes: Distribution of ecological communities; Major biomes of the world- Forest, Savana, Grassland, Desert and Tundra; Formation classes; Biomes and communities	6	5
7	Biogeography in the Anthropocene: Geography of biodiversity; Island biogeography and conservation; Climate Change and ecosystem processes	6	6,7

Teaching Strategies and Activities

- Lecture with multimedia, interactive discussions, Group/Individual Assignment, Tutorial /Presentation/Quiz.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Lomolino, M. V., Riddle, B. R., & Whittaker, R. J. (2017). *Biogeography* (5th edition). Oxford University Press. 730. Sunderland, MA.
- Cox, C. B., Moore, P. D., & Ladle, R. J. (2020). *Biogeography: an ecological and evolutionary approach* (10th edition) John Wiley & Sons.
- Lomolino, M.V., Sax, D.F., & Brown, J.H. (2004). *Foundations of Biogeography: Classic Papers with Commentaries*. University of Chicago Press.
- Haggett, R.J. (2004). *Fundamentals of Biogeography* (2nd edition). Routledge: London and New York.

Course Code	: GEATh 108
Course Name	: Fundamentals of Anthropology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course begins with a brief introduction to anthropology, outlining its main fields and explaining why it is the most comprehensive discipline for the study of humans. It discusses what unites its various sub-fields under the term 'anthropology' and what makes it the most 'humanistic' science. Additionally, the course introduces key concepts of social and cultural anthropology, emphasising different cultural aspects through ethnographic examples.

Course Objectives

1. Introducing the meaning and orientations of anthropology
2. Discussion about its major areas and subfields
3. Orientation about the discipline's perspectives, techniques, history, and applications
4. Explaining cross-cultural views on social, political, economic, and belief systems in society
5. Description and analysis of issues like social inequality, colonialism, neo-colonialism, and the modern world system.

Course Learning Outcomes (CLOs)

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

1. Grasp the meaning and orientations of anthropology
2. Knowledge about anthropology's major areas and subfields
3. Proficient in using anthropological perspectives, techniques, history, and applications
4. Ability to understand cross-cultural views on social, political, economic, and belief systems in society
5. Recognise issues like social inequality, colonialism, neo-colonialism, and the modern world system.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	What is Anthropology? Meaning of anthropology; Features of anthropology; Orientations (scientific vs. humanistic) of anthropology	4	1
2	What Do Anthropologists Do? Various anthropological concerns; Major fields and subfields; Integration of different fields and subfields	4	2
3	How Do Anthropologists Do What They Do? Fieldwork, cross-cultural comparison, and case study (things that are common to all major branches); Excavation (required for biological and archaeological anthropology), linguistic survey (for linguistic anthropology); Short-term participatory research of several kinds and	4	3

	focused ethnographic survey (for applied anthropology)		
4	Perspectives of Anthropology: A holistic approach of anthropology; Relativistic, combination of emic and etic, and comparative; Anthropology and colonialism	4	3
5	A Short History of Anthropology: Before 1850; 1851 to 1900; 1901 to 1950; 1951 to 2000; 2000, and onward	4	1,2,3
6	Culture: Concept of culture; Characteristics of culture; Perspectives of culture	4	4
7	Social Organization: Kinship, descent, and kinship terminology; Incest taboo; Marriage and rules of exogamy and endogamy; Different types of marriage and their functions	4	4
8	Adaptive Strategies for Making a Living: Foraging; Cultivation (horticulture and agriculture); Pastoralism and industrialism; Cross-cultural comparison of production, distribution, exchange, and market systems	4	4
9	Comparative Political Systems: Stateless society- band, tribe, and chiefdom; The state	4	4
10	Social Inequality: Race; Ethnicity; Caste; Gender	4	4
11	Religion from Anthropological Perspective: Religion; Culture: beliefs, and rituals; Religious practitioners	4	4
12	Colonialism and Neo-colonialism: Historical background; Domination; Exploitation and its impacts	4	5
13	Modern World System: Global stratification and poverty; The open and closed class system	2	5
14	Why Should We Study Anthropology? Application of anthropological knowledge for bringing in desirable changes for humans	2	1-5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Barbara, D. Miller. (1999). *Cultural anthropology*. Boston: Allyn & Bacon.
- Ember, C. R., & Ember, M. (1988). *Anthropology*. New Jersey: Prentice-Hall.
- Eriksen, T. H., & Nielsen, F. S. (2001). *A history of anthropology*. London: Pluto Press.
- Eriksen, T. H. (2004). *What is anthropology?* London: Pluto Press.
- Kottak, C. P. (2012). *Anthropology*. New York: McGraw-Hill.
- Muckle, R., de González, L. T., & Camp, S. L. (2022). *Through the lens of anthropology: An introduction to human evolution and culture* (3rd ed.). University of Toronto Press.
- Pink, S. (Ed.). (2005). *Applications of anthropology: Professional anthropology in the twenty-first century*. New York & Oxford: Berghahn Books.
- Service, E. R. (1985). Cultural anthropology vs social anthropology. In *A century of controversy: Ethnological issues from 1860 to 1960*. Orlando: Academic Press.
- Sutton, M. Q. (2022). *A concise introduction to cultural anthropology*. London: Routledge.

Course Code	: GELb 109
Course Name	: Topography and Geomatic Surveying
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Topography and Geomatic Surveying is a foundational course that develops students' skills in measuring, mapping, and representing the Earth's surface. It integrates traditional surveying methods with modern geomatic technologies to generate accurate spatial data for planning and environmental applications. Students learn to collect, process, and interpret data on physical features and elevations using instruments ranging from chain and tape to total stations and drones. The course emphasises fieldwork, data processing, accuracy, and error analysis, culminating in the production of a topographic map. It prepares students for applications in GIS, urban planning, environmental management, and geospatial analysis.

Course Objectives

The course aims to:

1. Introduce fundamental concepts of topographic and geomatic surveying, including maps, scale, and spatial data
2. Develop practical field surveying skills using traditional and modern instruments
3. Provide understanding of measurement techniques, data recording, and error assessment
4. Introduce advanced surveying technologies such as total stations and drone-based mapping
5. Develop skills to process spatial data and produce topographic maps for applications in geography, planning, and environmental studies

Course Learning Outcomes (CLOs)

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

1. Demonstrate understanding of fundamental principles of topographic and geomatic surveying, including map concepts, spatial data, and measurement techniques.
2. Conduct field surveys using appropriate instruments (chain, level, total station, drone) and apply standard procedures for data collection and recording.
3. Analyse and process surveying data, including calculation of distances, elevations, and error adjustment, ensuring accuracy and reliability.
4. Apply modern geomatic techniques, including total station and UAV-based surveying, for spatial data acquisition and mapping.
5. Produce a complete topographic map by integrating field data, including contours, features, and standard cartographic elements.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to topographic surveying: Map, scale, map data, data sources and surveying; Definition, purposes and types of	6	1

	surveying; Surveying and mapping physical features and elevations; Evolution of surveying techniques and technologies		
2	Chain-Tape, and Plane Table Surveying: Survey instruments; Field setup; Measurement and mapping workflow; Field sketching, note-taking, and data recording techniques; Common errors in field surveying and methods of minimisation; Conducting chain-tape and plane table survey in the field	12	2, 3, 4
3	Levelling and Elevation Surveying: Introduction to levelling and vertical measurement; Instruments (dumpy level, auto level, and digital level); Types of levelling (Differential levelling, Profile levelling, Reciprocal levelling); Benchmarks and reduced levels (RL); Error calculation and adjustment methods; Conducting levelling or elevation survey in the field	9	2, 3, 4
4	Total Station Surveying: Principles of Electronic Distance Measurement (EDM); Components and functioning of total station instruments; Field procedures and measurements; Data recording, storage, and field coding systems; Downloading, processing, and basic mapping of survey data; Field demonstration	15	2, 3, 4
5	Drone-Based Topographic Surveying: Introduction to UAV (drone) surveying and applications; Flight planning, mission design, and safety protocols; Aerial image acquisition and data collection principles; Basics of photogrammetry: DSM, DEM, and orthomosaic generation; Use of Ground Control Points (GCPs) for accuracy improvement; Accuracy assessment and limitations of drone surveys; Field demonstration	9	2, 3, 4
6	Topographic Mapping Project (a) Selection of a study site (e.g., campus area, open field, park, or construction site) (b) Application of an appropriate surveying method(s) in the field (c) Collection of spatial data, including coordinates, elevations, and feature points (d) Processing and integration of field data (e) Preparation of a complete topographic map including Contours and elevation representation; Physical and built features; Labels, symbols, scale, north arrow, and legend	12	5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Field demonstration, Group/Individual Assignment/Presentation.
- Presentation and assignment topic will be decided by the course teacher.

Reading Materials

- McCormac, J. C., Sarasua, W. A., & Davis, W. J. (2012). *Surveying* (6th ed.). John Wiley & Sons
- Wolf, P. R., & Ghilani, C. D. (2012). *Elementary surveying: An introduction to geomatics* (13th ed.). Pearson.
- Chandra, A. M. (2018). *Plane surveying* (3rd ed.). New Age International.
- Singh, R. L., & Singh, R. P. B. (2012). *Elements of practical geography* (Revised ed.). Kalyani Publishers.

Course Code	: GEDLb 110
Course Name	: Fundamentals of Computer
Course Type	: Practical
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a general introduction to computers with an emphasis on computer literacy, particularly for students in geography and environmental studies. Topics covered include hardware, software, operating systems, data communications, applications software, and information systems. The course also emphasises the use of computers for research work, data analysis, report generation, and effective communication in the field of geography and environment

Course Objectives

The main objectives of the course are:

1. To understand the basic concepts of computer programming and hardware/software integration.
2. To gain proficiency in using computers for basic tasks such as word processing, internet browsing, email communication, and handling data.
3. To acquire the necessary skills for managing and analysing environmental and geographic data.
4. To learn how to operate Microsoft Office tools, including Word, Excel, PowerPoint, and Google services, which are crucial for academic and research tasks in geography and environment

Course Learning Outcomes (CLOs)

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

1. Explain the fundamental concepts of computer systems, including hardware, software, and operating systems, and perform basic system operations.
2. Create, format, and manage professional-quality documents using word processing tools for academic and research purposes.
3. Apply spreadsheet tools and functions to organize, analyze, and visualize data for effective decision-making and problem-solving.
4. Design and deliver structured and visually effective presentations using presentation software with appropriate multimedia integration.
5. Demonstrate effective use of internet technologies, including web browsing, information retrieval, troubleshooting connectivity issues, and accessing digital services.
6. Use digital communication and collaboration tools (e.g., email, cloud-based platforms) to support teamwork, information sharing, and professional communication.
7. Utilize cloud-based applications and Google services to create, manage, and share academic content collaboratively.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Computer and Computer Hardware & Software	3	1
2	Computer Operating System	3	1
3	Perform Word Processing	6	2
4	Perform Spreadsheet and Microsoft Excel	6	3
5	Perform Microsoft PowerPoint	6	4
6	Introduction to Internet, WWW, and Web Browsers	4.5	5
7	Communications and Collaboration	4.5	6
8	Applications of Google Services	4.5	7
9	Cloud Storage and Collaboration Tools	4.5	6,7

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Subramanian, N. (1986). *Introduction to computers: Fundamentals of computer science*.
- Norton, P. (2010). *Introduction to computer* (7th ed.). McGraw Hill India.
- Rahman, M. L., & Hossain, M. A. (2016). *Computer fundamentals*. Systech Publication Ltd.
- Abid, M., & Amjad, M. (2015). *Fundamentals of computers*. International Publishing House.
- Rajaraman, V., & Adabala, N. (2014). *Fundamentals of computers*. Prentice Hall India Learning Private Limited.
- Sinha, P. K., & Sinha, P. (2019). *Computer fundamentals*. BPB Publications.
- Nagpal, D. P. (2021). *Fundamentals of computer*. S. Chand and Company Limited.
- Microsoft. (n.d.). *Microsoft Word*. Retrieved from <http://www.microsoft.com>

Course Code	: GELb 111
Course Name	: Introduction to Research and Fieldwork in Geography and Environment
Course Type	: Practical (Fieldwork)
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces students to the fundamental concepts and practices of research and fieldwork in geography and environment. It combines theoretical understanding with hands-on field experience to develop essential skills in data collection, observation, analysis, and reporting. The course prepares students to conduct basic geographical research by integrating both physical and human environmental perspectives.

Course Objectives

1. Provide foundational knowledge of research concepts, types, and processes in geography.
2. Develop understanding of fieldwork principles and their significance in geographical studies.
3. Equip students with skills for data collection from physical and human environments.
4. Introduce basic research design, site selection, and field investigation techniques.
5. Foster ethical awareness in conducting geographical research.

Course Learning Outcomes (CLOs)

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

1. Explain basic research concepts, types, and processes in geography.
2. Apply fieldwork techniques for collecting primary and secondary data.
3. Conduct basic field investigations and record observations systematically.
4. Analyse and interpret field data using simple tools and techniques.
5. Demonstrate ethical practices in geographical research and fieldwork.
6. Prepare and present a structured field-based research report.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Research in Geography: Concepts, types, importance, research process, scope, and nature of geographical research	3	1
2	Introduction to Fieldwork: Meaning, scope, nature, and importance	3	1,2
3	Steps of Research: Research problem identification, literature review, research gaps, research questions and objectives, research design	6	1,2
4	Site Selection for Fieldwork: Criteria for site selection, reconnaissance survey	3	2,3
5	Data Collection Procedures: Primary and secondary data, observation techniques, interview methods, merits and demerits	4.5	2,3

6	Observation of Natural and Human Environment: Landforms, soil, land use/land cover, water bodies, settlement patterns, transport networks, culture, society, and economic activities	4.5	3
7	Research Ethics: Ethical approval, informed consent, cultural sensitivity, anonymisation, academic integrity	3	5
8	Fieldwork and Activities: Field preparation, data collection, recording, and documentation	3	2,3
9	Report Writing: Data processing, analysis, presentation, and report preparation	3	4,6
10	Referencing and Bibliography: In-text citation, referencing styles, and bibliography preparation	3	5,6
11	Field Report Writing/ Presentation	6	1-6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Field visit, data collection, analysis and reporting.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Clifford, N. J., Holloway, S. L., Rice, S. P., & Valentine, G. (eds.). (2009). *Key concepts in geography* (2nd ed.). SAGE Publications Ltd.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.
- Gouide, A. (1990). *Techniques in Physical Geography*, Routledge, London

Course Code	: GETH 201
Course Name	: Geomorphology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course is the advanced part of Physical Geography, which focuses on the land formation process, both on land and on the sea floor of the Earth. This study is both descriptive and quantitative; it deals with the morphology, processes, and origins of landforms. The ultimate goals of geomorphology are to understand the way in which landforms are created and to document the evolution of landforms through time. In this course, we focus on endogenic, exogenic and planetary geomorphology, mass movement and weathering processes.

Course Objectives

1. Explaining basic principles for the development of landforms through time
2. Explain landform building processes and the factors controlling their mechanisms
3. Explain how variations in climate and environment affect landform development
4. Understand the interactions between endogenic and exogenic processes
5. Relate the geomorphology on Earth to Planetary geomorphology.

Course Learning Outcomes (CLOs)

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

1. Differentiate geomorphological thoughts and theories
2. Explain the formation of different land features on earth surface, and describe different land formations in Bangladesh
3. Describe and explain the evolution in Glacial and periglacial landforms, arid landforms,
4. Explain floodplain landforms and delta formation, and the relation between geomorphology and human activities.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Geomorphology: Definition, Scope and Subject Matter; Objectives and Methods of Explanations; Form, Process and Pattern; Application of Geomorphological Knowledge to Environmental Problems; Geochronology; Development of Land Surface	4.5	1
2	Development of Geomorphological Thoughts; Pre-Davision Geomorphology-James Hutton; Davision Cycle of Erosion; Penck and King's Concepts	4.5	1
3	Theories on the Various Tectonic Aspects of the Earth's Surface Processes: Wegener's Continental Drift Theory and Plate Tectonic Theory; Theories of Earthquake, Volcanism;	3	1

	Theories of Isostasy and Gravity Tectonics; Kober's Geosynclinal Orogenic Theory and Mountain Building		
4	The Humid Geomorphic Environment: Running water and streams: Origin and Evolution of rills, gullies, streams, stream channels: classification and characteristics; drainage patterns & channel patterns; Process of valley development	6	2
5	Flood, Floodplain and Delta: Definition; causes, types, Flood Control, Flood Management, <i>Delta</i> : type, formation, structures and global distribution. Bengal Delta: Wetland morphology and ecology, Floodplain Management	6	2,3
6	The Arid and Semi-Arid Geomorphic Environment; Characteristics; Desert Environment; Semi-Arid Environments; Fluvial Process in Arid /semi-arid Environment; Pediments and Pediplains; Wind and Aeolian Land Forms: Erosional; Depositional	4.5	2,3
7	The Glacial and Periglacial and Karst Geomorphic Environments: Process and Products; Erosional Features; Depositional Features	4.5	2,3
8	Palaeo-Geomorphology: <i>Geochronology:</i> Lithostratigraphy, Biostratigraphy (pollen and diatom analysis) and Chronostratigraphy (C14 dating, dendrochronology); Past-Geomorphological Environments: Process and Products; Palaeo-Climatology	4.5	2,3
9	Applied Geomorphology; Geomorphology and Agriculture; Geomorphology and Industry; Geomorphology and Urbanisation; Geomorphology and Transport	4.5	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual assignment, Presentation
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Bierman, P., & Montgomery, D. (2019). *Key concepts in Geomorphology*. W. H. Freeman.
- Gregory, K. J., & Lewin, J. (2014). *The Basics of Geomorphology*. Sage.
- Islam, M. S. (2001). *Sea-Level Changes of Bangladesh: Last Ten Thousand Years*.
- Kale, V. S., & Gupta, A. (2025). *Introduction to Geomorphology*. Universities Press.
- Leopold, W., & Miller, J. P. (2012). *Fluvial Process in Geomorphology*. Dover Publications.
- Sparks, B. W. (1986). *Geomorphology*. Longman.
- Thornbury, W. D. (2004). *Principles of Geomorphology*. CBS Publishers & Distributors.

Course Code	: GETH 202
Course Name	: Economic Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course introduces to basic approaches, concepts and theories that economic geographers use; it helps to understand how these concepts and theories may be applied in the context of the globalising world economy; and make aware of the ways in which economic geography approaches can inform policy making

Course Objectives

1. Highlight the importance of economic geography in analysing contemporary societies and economies.
2. Provide a comprehensive introduction to basic concepts and key theoretical approaches in economic geography.
3. Introducing economic geography as a dynamic, diverse and contested body of knowledge
4. Enable the application of this knowledge to key social and economic issues in the context of economic globalisation.
5. Encourage thinking about policy options for overcoming inequality and uneven development in the globalising world.

Course Learning Outcomes (CLOs)

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

1. Define key concepts of Economic Geography, including the key terms of economic geography.
2. Explain the evolution of economic geography and its interaction with political economies.
3. Apply spatial economic principles to analyse economies of scale and locational choices.
4. Differentiate between primary, secondary, and tertiary economic activities and their linkages.
5. Assess food and economic security issues, including policy responses to global challenges.
6. Evaluate the impacts of economic globalisation on production networks and value chains.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Definition and key concepts of Economic Geography; Economic men, PCE mechanism, economic activity	3	1
2	Economic geographies, political economies and world views: Changing nature of economic geography as a field of study	3	2
3	Fundamentals of spatial economics: Traditional and modern economies, economies of scale	3	3
4	Primary economic activity: Characteristics and types of primary economic activities: agriculture, fishing, mining, and forestry	3	4

5	Secondary economic activity: Characteristics and components of secondary economic activity; flows and linkages	3	4
6	Tertiary economic activity: Characteristics; Sectors of tertiary economic activities	3	4
7	Principles of locational choice: The laws of returns; The concept of rent; Economic model of spatial organisation; Organisation of urban space; Locational decisions and choice by manufacturing industry	6	4
8	Cities as retail and service centres	3	3
9	Regional economy: Classification; Growth and development, Dynamics of world trade and investment	3	5
10	Population dynamics and the structure of economy	3	5
11	Food and economic security issues: Land scarcity and degradation; World grain trade; Population and economic security issues; Food security: lines of defence, the myths of hunger and deprivation	3	5
12	Economic geographies of the contemporary world: Geographies of economic globalisation (investment, production, trade, consumption) in agriculture, manufacturing and services; Trans-national and multi-national corporations: global commodity chains, production networks and value networks	3	6
13	Geography and policy challenges: Policy challenges- uneven development and inequality in the global age; Key policy paradigms: Neo-liberalism, Keynesianism, Socialism, 'Third way' and Alternative economic approaches	3	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Coe, N. M., Kelly, P. F., & Yeung, H. W. (2019). *Economic Geography: A Contemporary Introduction*. John Wiley & Sons.
- Hudson, R. (2005). *Economic Geographies: Circuits, Flows and Spaces*. Sage Publications.
- MacKinnon, D., & Cumbers, A. (2018). *An Introduction to Economic Geography: Globalisation, Uneven Development and Place*. Routledge.

Course Code	: GEATh 203
Course Name	: Introduction to Soil Science
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Soil is one of the most important natural resources. It is at the heart of terrestrial ecology, and an understanding of the soil system is the key to the success and environmental harmony of any human use of the land. This course is designed to help make your study of soils a fascinating and intellectually satisfying undertaking. We are confident that much of what you learn will be of enormous practical value in equipping you to meet the many natural resources challenges of the current century. Moreover, this course is to explain the fundamental principles of soil science in a manner that you will find relevant to your interests. Throughout, the text emphasises the soil as a natural resource and highlights the many interactions between the soil and other components of forest, range, agriculture, wetland, and constructed ecosystems.

Course Objectives

1. To introduce the soil as a natural resource
2. Identify the factors of soil formation and distinguish between the active and passive factors.
3. Describe how soil-forming factors may interact to produce a soil seen in different places in the landscape.
4. Define the basic chemical and physical processes of soil formation.
5. Identify the main soil horizons, and describe the basic differences between each.
6. Given information on geographic location, climate, biota, and parent material, predict the soil Order that exists at the site.
7. Identify and describe the roles of soil in the global ecosystem.
8. Describe and locate human activities that cause soil degradation and/or erosion.

Course Learning Outcomes (CLOs)

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

1. Students will be able to obtain basic knowledge about soil, its components, formation process, profile etc.
2. They will be able to explain the importance of soil as a major component of the environment.
3. Students will have an idea about world's soil types and their consequences.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Definition, Nature and Field of Soil Geography, Soil as Environmental Interface, Components of Soil, Physical Properties of Soil, Chemical Properties of Soil	7	1, 2
2	Formation of Soil: Factors influencing soil formation, Soil Forming	5	1, 2, 3

	Process		
3	Soil Profile: Soil Layers (Horizon), Characteristics of Layers	4	1, 2, 3
4	Soil Organic Matter: Process of decomposition, Factors of decomposition, Humus, genesis and nature, Global carbon cycle, Influence of OM on Plant growth	8	2, 3
5	Soil Erosion: Water erosion, mechanics, effects of Water Erosion, Wind Erosion – Process and Importance, Soil Conservation	7	2, 3
6	Soil Classification: Concept of Individual Soil, Comprehensive Soil Classification system (USDA/ BRITISH)	6	2, 3
7	Geographic Soil Information: Soil Spatial variability, Techniques and Tools for Mapping	5	2, 3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Brady, N. C., & Weil, R. (2010). *Elements of Nature and Properties of Soils* (3rd ed.). Prentice Hall.
- Brady, N. C., & Weil, R. R. (2002). *The Nature and Properties of Soils* (13th ed.). Pearson-Prentice Hall.
- Park, C. (2000). *The Environment: Principles & Application*. Routledge.
- Robinson, H. (1982). *Biogeography. Part Two: "Soils-Their Nature, Classification and Use"*. MacDonald & Evans.
- Buchman, H. O., & Brady, N. C. (1971). *The Nature and Properties of Soils*. Eurasia Publishing.
- Strahler, A. N., & Strahler, A. H. (n.d.). *Modern Physical Geography*. John Wiley.

Course Code	: GEATh 204
Course Name	: Fundamentals of Geology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Geology is the core discipline of the earth sciences and includes the processes related to plate tectonics and mountain building, volcanoes and earthquakes, and the long-term evolution of Earth's lithosphere, hydrosphere and atmosphere. Because of the ever-increasing demand for resources, the growing exposure to natural hazards, and the changing climate, geology is of considerable societal relevance. This course introduces students to the basics of geology and addresses topics ranging from mineral and rock identification to the origin of the continents.

Course Objectives

1. To discuss how different earth processes (for example, plate tectonics, erosion and sedimentation) work and interact, and how different minerals, rocks and landforms result from various processes.
2. To make them understand the link between cause and effect for different geological processes (for example, the forces driving plate tectonics).
3. To explain, classify, and describe sediments, minerals, rocks, and their formation.
4. To introduce environmental geology

Course Learning Outcomes (CLOs)

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

1. Explain basic concepts in Geological science.
2. Explain the formation of different land features of the Earth's surface and internal structures;
3. Describe and explain the origin and evolution of life throughout the geological time scale
4. Analyse the economic and environmental implications of geological science and its relationship with human beings.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Geology: Historical Development, Origin of the Earth and the Solar System	6	1
2	Geological Time scale: Fundamental geological laws and geological concepts, relative and absolute age dating and their principles, Radiometric age dating, , unconformities and their types. Evolution of life forms in different periods	6	2
3	Structural Geology: Definition, scope, Fold-definition, classification;: Bases of fold classification; Fault: definition, types of faults, movements along fault plane, Joint – definition, description, classification and origin; Unconformity – definition,	7.5	1, 2

	descriptions and types, Lineation – definition, description, types, origin		
4	Stratigraphy: Time unit, rock unit, time-rock unit, Lithostratigraphy, Biostratigraphy and Chronostratigraphy	7.5	2, 3
5	Mineralogy: Introduction and scope of Mineralogy, Physical and Chemical Properties of Minerals; Rock-forming minerals: Genesis of Minerals and Environments of Mineral Formation	7.5	4
6	Environmental Geology: Definition, Man-geology interaction, Geo-hazard, Geo-resource extraction and Management, Environmental Impact Assessment	7.5	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Bridge, J., & Demicco, R. (2008). *Earth surface processes, landforms and sediment deposits*. Cambridge University Press.
- Islam, M. S. (2001). *Sea-Level Changes of Bangladesh: Last Ten Thousand Years*. Asiatic Society.
- Rothery, D. (2016). *Geology: A complete introduction*. Teach Yourself.
- Sparks, B. W. (1986). *Geomorphology*. Longman Green.
- Thornbury, W. D. (2004). *Principles of Geomorphology*. CBS Publishers & Distributors.
- Tarbuck, E., Lutgens, F. K., & Linneman, S. (2019). *Earth: An introduction to Physical Geology* (13th ed.). Pearson.

Course Code	: GEDLb 205
Course Name	: Fundamentals of Programming
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

In this course, the undergraduate students of Geography and Environment are introduced to the basics of programming and computational thinking. This course helps in building logical reasoning and problem-solving skills that may be needed while dealing with spatial data. The course focuses on practical programming aspects used in geographic analysis and modelling in an environmental setting. The course teaches important programming aspects like variables, functions, loops, and conditional statements with respect to geography and environment.

Course Objectives

1. Develop an understanding of the basics of programming and computational thinking.
2. Train students to write basic computer programs to solve geographic and environmental problems.
3. Train students to process and visualise data using programming.
4. To enhance the analytical skills of students.
5. Provide knowledge about programming in the field of Geographic Information Systems (GIS).
6. Preparation for more advanced courses on geospatial technologies and data science.

Course Learning Outcomes (CLOs)

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

1. Discuss programming fundamentals, syntax, and computational thinking.
2. Recognise and define problems using algorithms and flowcharts.
3. Utilise programming elements such as variables, operators, conditions, and looping structures.
4. Create programs that analyse geographic and environmental information.
5. Perform data analysis by programming.
6. Utilise programming functions and modular programming principles.
7. Practice data visualisation in geographic/environmental datasets.
8. Check and validate the output of a program.
9. Apply programming knowledge in problem-solving within the context of GIS.
10. Exhibit self-learning and adaptability skills in programming

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Programming and Computational Thinking	6	1
2	Algorithms and Flowcharts	6	2
3	Programming Basics (Variables, Data Types, Operators)	6	3
4	Control Structures (Conditional Statements)	6	3
5	Loops and Iteration	6	3
6	Functions and Modular Programming	6	6
7	Arrays and Basic Data Structures	6	5
8	File Handling and Data Input/Output	6	4
9	Introduction to Data Analysis using Programming	6	5
10	Data Visualization Techniques	6	7
11	Programming for GIS and Environmental Applications	6	9
12	Debugging and Error Handling	6	8
13	Project Work and Presentation	12	10

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Downey, A. (2016). *Think Python: How to Think Like a Computer Scientist* (2nd ed.). O'Reilly Media.
- Matthes, E. (2019). *Python Crash Course* (2nd ed.). No Starch Press.
- Zelle, J. (2017). *Python Programming: An Introduction to Computer Science* (3rd ed.). Franklin, Beedle & Associates.
- VanderPlas, J. (2016). *Python Data Science Handbook*. O'Reilly Media.

Course Code	: GELb 206
Course Name	: Fundamentals of GIS and Computer Cartography
Course Type	: Practical
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

This introductory course is designed to provide students with the foundational knowledge and practical skills necessary to work with Geographic Information Systems (GIS) and computer cartography. Students will be introduced to key concepts of spatial data management, map design, and cartographic visualisation techniques. The course is aimed at second-year students and covers both theoretical aspects and hands-on practice, focusing on the use of GIS software (such as ArcGIS) to manage, analyse, and represent spatial data effectively.

Course Objectives

1. A comprehensive understanding of GIS concepts, spatial data types, and the principles of cartography.
2. Practical skills in managing spatial and attribute data using GIS software such as ArcGIS, including tasks like data editing, analysis, and visualisation.
3. The ability to design and create thematic maps using advanced cartographic techniques, incorporating map elements like legends, scale bars, and annotations.
4. Proficiency in conducting geospatial analyses using tools for buffering, overlay analysis, and querying, with an emphasis on decision-making.
5. Knowledge of map projections, coordinate systems, and the creation of professional map layouts with proper cartographic design principles.
6. Experience in sharing and collaborating on GIS projects using web-based platforms such as ArcGIS Online, enabling effective teamwork and data accessibility.
7. The ability to integrate spatial and attribute data to solve practical geographic problems, supporting academic research and decision-making in geography and environmental studies.

Course Learning Outcomes (CLOs)

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

1. Explain fundamental concepts of GIS, computer cartography, spatial data, and geographic information systems components.
2. Interpret spatial data, including maps, coordinate systems, projections, and topology, for accurate geographic analysis.
3. Apply spatial data models (raster and vector), data structures, and attribute data management techniques in GIS environments.
4. Analyse and manage geospatial data using GIS tools, including data input, editing, querying, and spatial analysis techniques (e.g., buffering, overlay).
5. Use GIS software (e.g., ArcGIS) to create, design, and produce maps with appropriate cartographic principles and symbolization techniques.
6. Design and interpret thematic maps using appropriate classification methods and visualisation techniques for decision-making.

7. Develop effective map layouts and cartographic presentations incorporating essential elements and visualisation standards.
8. Utilise cloud-based GIS platforms (e.g., ArcGIS Online) to publish, share, and collaborate on geospatial data and maps.
9. Apply cartographic design principles, including colour schemes, symbolization, and aesthetics, to enhance map clarity and usability.
10. Demonstrate independent learning and professional development skills in GIS through practical exercises, projects, and the use of emerging geospatial technologies.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to GIS and Computer Cartography	2	1
2	Understanding Spatial Data (maps, scale, topology, spatial referencing)	3	2
3	Spatial Data Models and Data Structures (raster, vector, attribute data)	3	3
4	Map Projections and Coordinate Systems	3	2
5	Data Management and Spatial Analysis in GIS	4	4
6	Working with GIS Software (ArcGIS tools and map creation)	4	5
7	Cartographic Principles and Symbolization	3	5,9
8	Creating Thematic Maps (classification and interpretation)	3	6
9	Map Layouts and Cartographic Visualisation	3	7
10	Sharing Maps and Data using Cloud GIS (ArcGIS Online)	3	8
11	Practical Lab Exercises (GIS hands-on training)	5	3,4,5
12	Project Work (Thematic map + GIS analysis)	4	6,7,8
13	Final Review and Presentation	2	9,10

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Haywood, I., Cornelius, S., & Carver, S. (1999). *An introduction to geographical information systems*. Longman.
- Burrough, P. A., & McDonnell, R. A. (1998). *Principles of geographical information systems*. Oxford University Press.
- Aronoff, S. (1995). *Geographic information systems: A management perspective*. WDL Publications.
- Taylor, D. R. F. (1991). *Geographic information systems: The microcomputer and modern cartography*. Pergamon Press.
- Minami, M. (2000). *Using ArcMap*. ESRI Press.
- Vienneau, A. (2000). *Using ArcCatalog*. ESRI Press.

Course Code	: GETH 207
Course Name	: Cultural Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces the various methods used to study cultural geography and describes its nature and phenomena. At the same time, it explains how cultural practices change over time with evolutionary changes in material culture from the prehistoric period to the present. It also highlights the origin, background, propagation and extinction of the major civilisations on earth. The course also demonstrates the background, origin and characteristics of various races, ethnicities, religions, languages, etc. of the world.

Course Objectives

1. Familiarise students with fundamental concepts, themes and methods of cultural geography.
2. Enhance students' knowledge about the development of thoughts and ideas relating to diversified cultural phenomena of the world.
3. Highlight the importance of understanding cultural practices from early civilisations, including the origin and conservation.
4. Teach how cultural change takes place over time with the evolution of material cultures.
5. Present geographical dimension race, ethnicity, religion, language, with examples from local to global context.

Course Learning Outcomes (CLOs)

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

1. Explain the basics such as subject matter and branches, scope, themes and methods of cultural geography.
2. Demonstrate the brief development history of cultural geographical thoughts and concepts, along with major themes.
3. Identify the cultural traits, practices and significance of conserving those cultural aspects.
4. Explain the ancient civilisations, their practices and extinction and at the same time, they will be able to explain the evolution of civilisations, humankind, animals and plants.
5. Analyse the various dimensions of race, religion, ethnicity, language, etc., with special focus on the cultural aspects of Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Scope, Themes and Methods of Cultural Geography	3	1
2	Culture: Nature and Types, Cultural Ecology	3	2
3	Processes of Cultural Change: Normal Cultural Changes and Forced Cultural Changes, Acculturation and Assimilation, Innovation and Diffusion of Culture, Cultural Gap.	3	3

4	Evolution of Mankind: Australopithecus to Homo Sapiens Sapiens	3	3
5	Evolution of Material Culture: Stone Age (Paleolithic, Mesolithic and Neolithic); Age of Metals	3	3
6	Evolution of Livelihood: Domestication of Plants & Animals; Rise of Urbanism; Industrial Revolution; Post-Industrial culture and e-culture	9	3, 4
7	Major Extinct Culture Hearths: Mesopotamia; Nile Valley; Indus Valley; Chinese, Maya, Aztec and Inca	9	4
8	Geographic Dimensions of Race, Ethnicity, Religion, Language, with examples from Bangladesh	6	5
9	Cultural Heritage and Conservation: Types and Importance	3	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- de Blij, H. J., & Murphy, A. B. (1999). *Human geography: Culture, society and space*. Wiley.
- Broek, J. O. M., & Webb, J. W. (1969). *A geography of mankind*. Taylor & Francis.
- Wagner, P. L., & Mikesell, M. W. (Eds.). (1962). *Readings in cultural geography*. University of Chicago Press.
- Johnson, N. C., Schein, R. H., & Winders, J. (Eds.). (2013). *The Wiley-Blackwell companion to cultural geography*. Wiley-Blackwell.
- Anderson, J. (2015). *Understanding cultural geography: Places and traces*. Taylor & Francis.
- Sen, J. (2022). *Social and cultural geography*. Kalyani Publishers.

Course Code	: GETH 208
Course Name	: Geography of Natural Resources
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Natural resources constitute the foundation of human survival, economic development, and ecological stability. This course explores the types, distribution, conditions, utilisation patterns, concerns, and management approaches of major natural resources across different geographic contexts. Students will develop an understanding of how natural resources evolve over time, how human activities shape their availability, and how sustainability challenges can be addressed through scientific, technological, and policy-based interventions. The course places special emphasis on the Bangladesh context, alongside global perspectives, to build a comprehensive understanding of natural resource conservation and management.

Course Objectives

The main objectives are:

1. Provide an in-depth understanding of the various natural resources, their global and regional significance, and challenges associated with overexploitation.
2. Develop students' conceptual understanding of resource appraisal, assessment techniques, and management principles.
3. Expose students to cultural, political, economic, and ecological dimensions of natural resource use.
4. Introduce students to tools and techniques for evaluating resources and assessing sustainability concerns.
5. Enhance understanding of Bangladesh-specific resource management priorities, challenges, and strategic options.

Course Learning Outcomes (CLOs)

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

1. Understand and explain the fundamental concepts, types, characteristics, and cycles of natural resources.
2. Analyse the distribution, condition, and vulnerabilities of major global and regional resource ecosystems.
3. Evaluate the utilisation patterns, management practices, and environmental impacts of forest, land, water, mineral, and energy resources.
4. Assess contemporary resource-use issues related to population growth, economic development, technology, and climate change.
5. Demonstrate an understanding of global and national treaties, strategies, and sustainability frameworks relevant to resource management.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Natural Resources: Definitions, concepts, types, scope, spatial characteristics and temporal cycles; Resource ecosystems: Types, distribution, current condition, etc.	4.5	1, 2
2	Forest Resources: Extent of resource base, changing nature, regimes, use and environmental implications	6	3
3	Water Resources: Extent of resource base, supply and demand, quality, management	6	3
4	Land Resources: Biodiversity, protected areas and environmental conservation	6	3
5	Mineral Resources: Extent of resource base, scarcity and abundance, exploitation, international relations, conflict and impact of mining	4.5	3
6	Energy Resources: Sources, consumption, reserves and scarcity, environmental externalities	4.5	3
7	Contemporary Issues: Issues, Natural Resource Conservation: Economic development, population growth, technology and carrying capacity, climate change	4.5	4
8	Environmental Treaties and Strategies: Environmental movement and natural resources, progress of sustainability, equity and ethics, resource conservation strategies from Stockholm to Rio	6	5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Mather, A. S., & Chapman, K. (2018). *Environmental resources*. Routledge.
- McLellan, B. (2018). Sustainable future for human security. In *Environment and resources* (pp. 37–68). Springer.
- Chiras, D. D., & Reganold, J. P. (2009). *Natural resource conservation: Management for a sustainable future*. Pearson Education.
- Meffe, G. K., Nielsen, L. A., Knight, R. L., & Schenborn, D. A. (2000). *Ecosystem management: Adaptive community-based conservation*. Island Press.
- Mitchell, B. (1979). *Geography and resource analysis*. Longman.
- Grafton, R. Q., et al. (2004). *Economics of the environment and natural resources*. Blackwell Publishing.
- Islam, M. A. (2000). *Sampad babostapona*. Bangla Academy.
- Kabir, M. H., & Endlicher, W. (2012). *Exploitation of renewable energy in Bangladesh*. AHDPH.
- Rasheed, K. B. S. (2006). *Bangladesh: Resource and environmental profile*. AHDPH.

Course Code	: GEDTh 209
Course Name	: Fundamentals of Sociology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces students to the foundational concepts, theories, and methods of sociology as a discipline for understanding society and social behaviour. It explores key sociological perspectives on culture, social structure, stratification, and institutions, alongside processes of social change and transformation. The course also emphasizes contemporary issues such as globalisation, environment, and sustainability from a sociological viewpoint. Special focus is given to sociological understanding of Bangladesh, enabling students to connect theoretical knowledge with local social realities.

Course Objectives

1. Introduce the fundamental concepts, scope, and significance of sociology.
2. Develop understanding of classical and contemporary sociological theories.
3. Examine social structure, stratification, and inequality in society.
4. Explore major social institutions and their functions and transformations.
5. Analyse processes of social change, culture, and globalisation.
6. Apply sociological perspectives to understand Bangladeshi society.

Course Learning Outcomes (CLOs)

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

1. Explain the key concepts, scope, and sociological imagination in understanding society.
2. Analyze classical and contemporary sociological theories and their applications.
3. Examine social structure, stratification, and inequality in different societal contexts.
4. Evaluate the role and transformation of major social institutions.
5. Analyze processes of social change, culture, globalization, and environmental interaction.
6. Apply sociological perspectives to understand social issues in Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Sociology: Definition, scope, and importance of sociology; Society, culture, norms, values, and socialisation; Sociological imagination	3	1
2	Sociological Theories: Classical theories: functionalism, conflict theory, symbolic interactionism; Contemporary perspectives in social analysis	6	2
3	Social Structure and Stratification: Social structure and roles; Social stratification (class, gender, race/ethnicity); Inequality and social mobility	6	3

4	Social Institutions: Family, education, religion, economy, and state; Functions and transformations of institutions; Power, governance and social organisation	4.5	4
5	Culture and Society: Cultural diversity and identity; Media and society; Cultural change and modernisation	4.5	5
6	Society and Social Change: Society and technology (Gerhard Lenski); Society and conflict (Karl Marx); Tradition and rationality (Max Weber); Society and functions (Emile Durkheim); Demographic transition and societal change; Migration and sociological transformation of rural and urban areas; globalisation and social change	6	5
7	Key methods in sociology (i.e., Social Network Analysis (SNA))	3	4,5
8	Society, Environment, and Sustainability: Human–environment interaction from a sociological perspective; Environmental perception and behaviour; Social dimensions of environmental problems; Sustainability and community-based approaches	4.5	5
9	Sociology of Bangladesh: Sociological perspective of the emergence of Bangladesh, Social transformation in Bangladesh	4.5	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Giddens, A., & Sutton, P. W. (2017). *Sociology* (8th ed.). Polity Press.
- Macionis, J. J. (2017). *Sociology* (16th ed.). Pearson.
- Haralambos, M., & Holborn, M. (2013). *Sociology: Themes and perspectives* (8th ed.). Collins.
- Ritzer, G. (2018). *Sociological theory* (10th ed.). Sage Publications.
- Bendix, R. (1977). *Max Weber: An intellectual portrait*. University of California Press.
- Durkheim, E. (2014). *The division of labour in society*. Free Press.
- Marx, K. (1978). *The Marx-Engels reader* (R. C. Tucker, Ed.). W. W. Norton.
- Rahman, S., & Masud-Ali-Kamal, M. (2024). Social Transformation in Bangladesh. *Social Transformation in Bangladesh*.

Course Code	: GEDTh 210
Course Name	: Fundamentals of Statistics
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces fundamental statistical concepts and techniques essential for Geography and Environment students. It focuses on data organisation, descriptive and inferential statistics, spatial analysis, and their applications in environmental and geographical problem-solving. Emphasis is placed on interpreting real-world spatial data using statistical tools.

Course Objectives

1. To develop an understanding of statistical concepts and data analysis
2. To equip students with tools for analysing geographical data
3. To introduce probability and hypothesis testing
4. To enable the interpretation of spatial patterns using statistical methods
5. To build analytical skills for research in geography and environment

Course Learning Outcomes (CLOs)

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

1. Explain statistical concepts and data organisation methods
2. Construct and interpret frequency distributions and graphs
3. Apply measures of central tendency and dispersion
4. Analyse probability distributions and time series data
5. Perform hypothesis testing and inferential statistics
6. Apply correlation and regression analysis
7. Interpret spatial statistical techniques
8. Use statistical tools in environmental and geographical research

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Frequency Distribution, Table, Histogram, Polygon, Ogive, Forms of Distribution, Moments, Skewness, Kurtosis	6	2,3
2	Measures of Dispersion (Absolute & Relative)	5	3
3	Time Series Analysis	3	4
4	Sample and Census	2	1
5	Probability Theory (Addition & Multiplication Laws)	4	4
6	Probability Distributions (Binomial, Poisson, Normal; Properties of Normal Curve)	5	4
7	Hypothesis Testing (Null Hypothesis, Significance Level, t-test, Chi-square, ANOVA)	5	5

8	Correlation and Regression Analysis	4	6
9	Spatial Measures (Point Pattern, Mean Centre, Nearest Neighbour, Network Analysis)	5	7
10	Factor Analysis (Introductory)	2	8
11	Tutorial	1	1-8

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Dedicated sessions for real-world problem solving and case studies using geographical datasets.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Walpole, R. E., et al. (2017). *Probability and Statistics for Engineers and Scientists*. Pearson.
- Rogerson, P. A. (2019). *Statistical Methods for Geography*. Sage Publications.
- O'Sullivan, D., & Unwin, D. (2014). *Geographic Information Analysis*. Wiley.
- Gupta, S. C. (2018). *Fundamentals of Statistics*. Himalaya Publishing House.

Course Code	: GELb 211
Course Name	: Fundamentals of Remote Sensing
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Remote sensing provides the ability to collect information over large spatial areas; to characterize natural features on the ground; to observe surface areas and objects on a systematic basis and monitor their changes over time. This course is designed to disseminate the basic concepts of remote sensing to the students.

Course Objectives

1. Providing fundamental knowledge of Remote Sensing concepts and principles to understand its applications in geographical studies.
2. Familiarising students with remote sensing images, data types, and software tools for spatial analysis.
3. Developing skills in interpreting and analysing remote sensing images using appropriate software and techniques.
4. Enabling students to understand Earth resource satellites and utilise various types of satellite imagery for environmental and resource management.
5. Training students to collect, interpret, and analyse aerial photographs for geographical and spatial studies.

Course Learning Outcomes (CLOs)

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

1. Understand the fundamental concepts of remote sensing and the principles behind image acquisition and analysis.
2. Develop conceptual knowledge about platforms, sensors, and resolution characteristics of various satellite images.
3. Gain insights into the nature and characteristics of Earth resource satellites and their applications in environmental and geographical studies.
4. Apply practical skills to interpret and analyse satellite images using remote sensing software.
5. Perform data collection and interpretation of aerial photographs through drone surveys and other technologies.
6. Enhance the ability to integrate remote sensing data into solving geographical problems and contributing to resource management.
7. Acquire hands-on experience in utilising image processing techniques for environmental monitoring and spatial analysis.
8. Build competency in evaluating remote sensing outputs to inform policy-making and planning efforts.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Definition and Scope, Satellite Remote Sensing vs. Aerial Photography, Remote Sensing data acquisition, stages of remote sensing, historical development of remote sensing, familiar with RS software Labs: A) Introduction to remote sensing software B) Introduction with Remotely Sensed Images C) Remote sensing data sources and acquisition process provide a comprehensive introduction to basic concepts and key theoretical approaches in economic geography	6	1,2
2	Physics of Remote Sensing and EMR Interactions: Electromagnetic Radiation (EMR), Electromagnetic Spectrum, EMR Quantities, Radiant Energy, Radiant Flux, Irradiance, Existence, Solid Angle, Radiant Intensity, Radiance, Spectral Quantities, Radiation Laws, Planck's, Stefan, Boltzman and Kirchoff's Laws, Black-body Radiation, Interaction with Atmosphere, Atmospheric haze, Scattering and Contrast Reduction, Spectral Signature, Hemispheric Reflectance, Transmittance and Absorption. Labs: A) Principles of Electromagnetic Radiation, Atmospheric windows, and Atmospheric blinds. B) EMR Reflection, Emission, Scattering and Absorption and Albedo C) Spectral Signature of Soil, Water and Vegetation	12	3
3	Platforms, Sensors and Resolution Platforms: Ground-based, air borne, space borne, Sensors: Types of Sensors; Optical, Thermal, and microwave: sensor systems: Whiskbroom and push broom, Sensors used in NASA, IRS, Landsat, SPOT Satellites, IKONOS, QUICK Bird, Resolutions: spatial, spectral, temporal and radiometric. Labs: A) Image Resolution: spatial, spectral, temporal and radiometric. B) Comparison of resolution between different types of satellite imagery.	9	2,3
4	Earth Resource Satellites Definitions and characteristics, Sun-synchronous and geostationary satellites, NOAA Series, Landsat series, IRS series, satellite data types: FCC and PAN, MSS, HS, Future satellites Labs: A) Uses of Visible and IR Imagery B) Composition of True Color Image and False Color Image	9	2,3,6
5	Image Interpretation Introduction; Manual interpretation Vs Digital image processing; Elements of image interpretation, Factors affecting image interpretation, Image interpretation keys, Multi spectral concepts in image interpretation.	15	4,5,6

	Labs: A) Visual Interpretation of Satellite Images and Aerial Photographs; Use of collateral information B) Introduction to Digital Satellite image by Using Software (image information, Histogram etc.)		
6	Aerial Photography and Drone Survey Basic information and specifications of aerial photographs, Types of aerial photographs, Geometry of Aerial Photographs, Stereovision, Stereoscope, Relief displacement of vertical features and its determination; Vertical exaggeration and slopes. Factor affecting vertical exaggeration and its determination; Introduction to digital photogrammetry- Orthophotos and digital orthophotography; Use of Drone: GCPs; Flight Plan; Collection of aerial photos; Interpretation of aerial photos. Labs: A) Metrics of Aerial Photography: Scale, Image overlapping, Aerial mosaics B) Making measurements from aerial photography (object's location, distance, height measurement etc) C) Interpretation of aerial photos collected from drone survey	12	5,7

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Campbell, J. B. (1996). *Introduction to Remote Sensing* (2nd ed.). The Guilford Press.
- Chuvieco, E. (2020). *Fundamentals of Satellite Remote Sensing: An Environmental Approach* (3rd ed.). CRC Press.
- Elachi, C., & van Zyl, J. J. (2006). *Introduction to the Physics and Techniques of Remote Sensing* (2nd ed.). Wiley-Interscience.
- Jensen, J. R. (2015). *Introductory Digital Image Processing* (4th ed.). Pearson.
- de Jong, S. M. (Ed.). (2006). *Remote Sensing Image Analysis: Including the Spatial Domain*. Springer.
- Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). *Remote Sensing and Image Interpretation*. Wiley.
- Rees, W. G. (2012). *Physical Principles of Remote Sensing* (3rd ed.). Cambridge University Press.
- Solimini, D. (2016). *Understanding Earth Observation: The Electromagnetic Foundation of Remote Sensing*. Springer.

Course Code	: GELb 212
Course Name	: Research Methods and Fieldwork in Human Geography and Environment
Course Type	: Practical (Fieldwork)
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course entitled Research Methods in Human Geography and Environment is one of the very fundamental research methodology courses for the students of Geography. The course aims to develop fundamental concepts in students to carry out human-environmental biased empirical research. Students are expected to learn the theoretical aspects of human biased research in the class, and they get opportunities to apply those methods in the field. However, the course helps the students to develop their foundation on human biased research. Students, for the first time, also get a chance to learn practically by making overnight stays in different remote rural areas of the country.

Course Objectives

1. Developing students' concepts on the research problem, the importance of literature consultation, determination of research questions and objectives
2. Sharing with students the concepts of human bias, different research methodologies and their application
3. Sharing with students the sources of data, both primary and secondary and ultimately sources of geographical data
4. Orienting students with relevant research institutions in Bangladesh
5. Developing students' knowledge on field data collection, data processing and analysis
6. Teach students to prepare a research report based on field data analysis and interpretation

Course Learning Outcomes (CLOs)

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

1. Development of fundamental concepts of research in human geography
2. Students will be familiar with various research approaches
3. Students will be learning the significance and process of literature review
4. Defining and identifying research gaps
5. Students will learn research design and will be able to apply various tools and techniques of data collection
6. Students will prepare themselves for data processing, analysis and interpretation
7. Students will learn the process and style of report writing and submission.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Concept of research , types, Research process, Selecting and Defining Research Problem (identification of research problem, determining research questions and objectives, etc.), Various Research approaches, Types of qualitative and quantitative research	9	1,2
2	Preparing research design	9	2
3	Reviewing the literature (reasons for literature survey, process of literature review, state of the art in research, importance/relevance of literature review), References and bibliography: Techniques (style of reference writing, etc.)	9	3
4	Data sources and data collection techniques in Human Geography & Environment: Field Survey and Sampling. Selection of study area, Questionnaire designing and interview Techniques. Observation, field recording techniques. Rapid Rural Appraisals (RRA), Participatory Rural Appraisal (PRA)	9	3,4
5	Analysing & Interpretation of Data: Data Processing, Analysis and Interpretation	9	4,5
6	Designing and Writing the Report: Report writing based on a field survey on any research issue	9	6,7
7	Preparation for fieldwork and report submission (field site selection, design of survey techniques, field plan, sampling, Data processing and analysis, presentation of data and report writing	9	7

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation, Field visit, Data collection, analysis and reporting.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Clifford, N., French, S., & Valentine, G. (2010). *Key Methods in Geography*. Sage.
- Hoggart, K., Lees, L., & Davies, A. (2002). *Researching Human Geography*. Department of Geography, King's College London.
- Kothari, C. R. (1999). *Research Methodology: Methods and Techniques*. New Age International Publishers.

Course Code	: GETH 301
Course Name	: Thoughts and Concepts in Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Geographers observe places, processes and objects and look for common features. The classification of these common features generates concepts that help us to structure our knowledge and understanding and to communicate these with others (Lambert and Balderstone, 2010, p. 46). If you think about geographical concepts, you can probably produce a long list of examples. They may be abstract (e.g., erosion), concrete (e.g., beach), organisational (a way of linking the everyday to higher-level geographical ideas, such as interdependence) or belong to another category entirely (Brooks, 2013, pp. 76–80). Like you, students will possess their own understanding of geographical concepts and their own lists. There is no one definitive list of concepts and no correct categorisation of concepts. However, thinking about the world we inhabit in terms of geographical concepts is how we learn in geography. This course will help you to understand the nature of geographical concepts and their significance in promoting geographical learning.

Course Objectives

1. Examine the historical and philosophical development of modern geography and geographical knowledge.
2. Explore key discourses, debates, and controversies which shaped the modern discipline.
3. Development of geographical thought and practice within a broader societal and scientific perspective.
4. Emphasis on the geographies of the history of geographical thought – i.e. in what ways have, for example, the Nordic welfare states affected geographical thought and practice?.

Course Learning Outcomes (CLOs)

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

1. Demonstrate a comprehensive understanding of key theoretical perspectives and concepts in geographical thought.
2. Critically examine the relationship between geographical thought and its practical applications.
3. Analyse the influence of broader societal and scientific processes—such as evolutionary theory—on the development of geographical thought, particularly in the nineteenth century.
4. Explain the historical evolution of geography as a discipline.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Geography and the construction of the discipline: An academic discipline; The conceptual structure of the discipline; Organisational structure of the discipline	4.5	1

2	Foundation of Scientific Geography: The Emergence of Modern Geography after the Great Age of Explorations and Renaissance (Varenus, Kant), Alexander Von Humboldt, Karl Ritter and Darwin; The German School of Geography; The French School of Geography; Anglo-American Geography (Britain and USA); The Soviet and Russian Geography.	6	1
3	Dichotomies in Geography: Physical vs. human; Regional vs. systematic; Idiographic vs. Nomothetic; Theoretical vs. Applied	4.5	2
4	Trends of Contemporary Geography after World War II: Paradigms, Revolutions and Shift of Paradigm (New trends and approaches, Quantitative Revolutions); Behaviour Approach; Positivist Views; Humanistic Views; Reality and Realism; Critical Science and Critical Geography; Post Modern Geography; Gender Geography	4.5	2
5	Explanations in Geography: Methodological Issues and Problems in Geography; Routes to Scientific Explanation; A Priori and a Posteriori Analysis; Major Analytical Techniques (Regional vs. Systematic Analysis; Cognitive Description; Morphometric Analysis; Causes and Effect Analysis; Temporal Mode of Analysis; Ecological and Functional Analysis; Systems Analysis)	4.5	3
6	Role of Theory: Hypothesis, Models and Law	3	3
7	Development of Geography in South Asia with special reference to Bangladesh	3	3
8	Status of Geography in Bangladesh	3	4
9	Application of Geographical Knowledge	3	4
10	Teaching, Higher Education and Research	3	4
11	Further Scope of development	3	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Henderson, G., & Waterstone, M. (Eds.). (2009). *The Geographic Thought*. Routledge.
- James, P. E., & Martin, G. J. (1982). *All Possible Worlds: A History of Geographical Ideas* (2nd ed.). John Wiley & Sons.
- Hartshorne, R. (1959). *Perspectives on the Nature of Geography*. Harvard University Press.
- Martin, G. J. (2005). *All Possible Worlds*. Oxford University Press.
- Goudie, A. (2019). *The human impact on the natural environment: past, present, and future*. John Wiley & Sons.
- Sauer, C. (1956). "The Education of a Geographer". *Annals of the Association of American Geographers*, 46(3), 283–288.
- Hartshorne, R. (1939). "Perspective on the Nature of Geography". *Annals of the Association of American Geographers*, 29(4), 201–215.
- Haggett, P. (1983). *Geography: A Modern Synthesis*. HarperCollins.

Course Code	: GETH 302
Course Name	: Population Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The particular course is important for the students of geography to learn the major concepts of population geography and its scope, nature, approaches and application as a branch of human geography. This course focuses on the geographical aspects of population distribution, growth, and dynamics at the global and national level. Population growth and projection theories describe the causes and consequences of population dynamics in different world regions and over time. This course is extremely helpful for students to understand issues and challenges of population growth in Bangladesh and the constraints to manage the human resources effectively.

Course Objectives

1. Develop an understanding of population geography as a sub-field of mainstream geography and its scope and application
2. Describe the different sources of population data and analyse the errors in the data.
3. Share the basic concepts of population dynamics: fertility, mortality and migration
4. Demonstrate basic understanding of population growth theories
5. Provides a unique lens for observing population patterns and processes through a focus on spaces, places, and environmental connections.
6. Share the issues and challenges of different aspects of the population of Bangladesh

Course Learning Outcomes (CLOs)

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

1. Identify, describe and interpret key terms, themes, concepts and theories in population geography
2. Critically evaluate how population distribution and dynamics create differences among countries and regions.
3. Converse intelligently and empathetically about national and international population trends and patterns, recognising the connections between population dynamics and national issues and challenges in managing human resources.
4. Explain the importance of population projection and life table analysis
5. Interpret population dynamics of Bangladesh in relation to its existing policy and resources, and compared to global contexts, etc.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Definition, Scope and Development of Population Geography: Definition of Population Geography and its changing nature, scope, development of Population Geography, Population Geography as an applied science	5	1
2	Population data and data sources: Primary and secondary data sources; census, vital statistics, sample survey, population registers; Errors in data	3	3
3	Approaches to Population Geography: Trewartha, Hagerstrand and Zelinsky's approaches in studying Population Geography	4	1,2
4	Spatial aspects of population distribution and density: Determinants of spatial distribution and redistribution of population and population density	2	2
5	Patterns of Population Distribution: Biological category: Age, Sex, Race; Social category: Marital Status, Language, Religion, Education; Economic category: Occupation, income, purchasing power parity, and Residence category: Rural-Urban residence.	5	4
6	World Population Growth and Related Theories: History of world population growth; Pattern in the Western and Eastern world, Malthusian Theory, Optimum Population Theory, Demographic Transition Model, Boserup's Hypothesis	5	3
7	Population Dynamics: Fertility and proximate determinants of fertility; Fertility Transition: Global fertility today and into the future; Mortality: Global mortality today and into the future; Migration and its types, determinants, processes and patterns of migration.	5	4
8	Population Projection and Life Table Analysis: Future size and structure of the population by sex and age; Population projection methods: e.g. Mathematical method, Growth Component method, and Economic method; Life table analysis in fertility, labour force, and nuptiality	5	4
9	Population, Resources & Environment: The relationship between population changes and environment, Population-environment theories, international development & Population, Global and Regional conflict for over-population or migration, pollution and population	3	5
10	Population Policy: Uncertainty and risk of future demographic structural imbalance, population policies: Pro-Natalist and Anti-Natalist.	2	5
11	Population of Bangladesh: A Geographical Perspective: Current population size, density, fertility, mortality and migration, demographic dividend; Human resources, issues and challenges of human population growth through a case study on population of Bangladesh.	3	5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher
- PPT Slides, relevant articles, book chapters: Available to students on the course website

Reading Materials

- Newbold, K. B. (2021). *Population geography: Tools and issues*. Rowman & Littlefield Publishers.
- Smith, D. P. (2018). Population geography I: Human trafficking. *Progress in Human Geography*, 42(2), 297-308.
- Bailey, A. (2014). *Making population geography*. UK: Routledge.
- Greenhalgh, S. and Winckler, E. A. (2005). *Governing China's Population: From Leninist to Neoliberal Biopolitics*. Stanford: Stanford University Press.
- Jolly, C. (1994). "Four Theories of Population Change and the Environment." *Population and Environment*, 16(1), 61-90.
- Kirk, D. (2010). "Demographic transition theory." *Population Studies*, 50(3): 361-387.
- Lesthaeghe, R. (2014). "The second demographic transition: A concise overview of its development." *Proceedings of the National Academy of Sciences*, 111(51): 18112-18115.
- Mountz, A. (2004). "Embodying the Nation-State: Canada's Response to Human Smuggling." *Political Geography*, 23: 323- 345.
- Moseley, W. G., Lanegran, D. A., & Pandit, K. (Eds.). (2007). *The introductory reader in human geography: contemporary debates and classic writings*. Oxford: Blackwell.
- Silvey, R. (2007). "Unequal Borders: Indonesian Transnational Migrants at Immigration Control." *Geopolitics*, 12(2):265-279.
- Shryock, H. S. & Siegel, J. S. (2002). *The Methods and Materials of Demography*, New York: Academic Press
- Inc.
- Tyner, J.A. (2013). Population geography I: Surplus populations. *Progress in Human Geography*, 37(5): 701-711.
- Weeks, J. R. (2020). *Population: An introduction to concepts and issues*. USA: Cengage Learning Inc.

Course Code	: GEDTh 303
Course Name	: Fundamentals of Chemistry
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a comprehensive overview of the fundamental concepts of chemistry. The students will be able to understand basic principles of chemistry and the properties of different chemical species. Students will gain knowledge and understandings of atomic and molecular structures, composition, states and physical and chemical changes of them.

Course Objectives

Providing students with an understanding of the fundamental concepts of chemistry including the structure of matter, chemical bonding, reaction kinetics and equilibrium, and organic and nuclear chemistry.

Course Learning Outcomes (CLOs)

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

1. Explain the fundamental principles of atomic structure, chemical bonding, and periodic properties to predict the behavior of matter in natural systems.
2. Analyze the physical laws governing gases, liquids, and solids to interpret processes of earth's spheres.
3. Evaluate chemical equilibrium, reaction rates, and acid-base chemistry in the context of environmental buffering.
4. Examine the principles of organic and nuclear chemistry to understand their roles in environmental pollution, energy production, and radioactive decay.
5. Apply scientific reasoning to solve quantitative problems involving chemical concentrations and reaction mechanisms relevant to environmental monitoring.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Matter and Energy: State of Matters; Changes of State: Phase Transitions and Phase Diagrams; Pure Substances and Mixture; Types of Mixtures	3	1,2
2	Atoms and Molecules: Atomic Theory; Structure of Atom; Atomic number and Mass Number, Isotopes	3	1
3	Elements and Compounds: Electronic configuration of elements: Aufbau principle, Pauli exclusion principle, Hund's rule; The Periodic Table: Salient features, classification of elements, Periodic properties of elements in periodic table	4.5	1
4	Chemical Bonding: Ionic and Covalent bond, Metallic Bond, Electronegativity, Polar Bonds, and Hydrogen Bonding; Ions;	3	1

	Oxidation number; free-radicals		
5	Chemical Reactions and Chemical Equilibrium: Chemical Reactions: Types of Chemical Reactions; Oxidation- Reduction or RED-OX Reactions; Reaction rates; Chemical Equilibrium in reactions: Concept of equilibrium, Equilibrium law equilibrium constant, Le Chatelier's principle, effect of temperature, pressure, concentration and inert gas on chemical equilibrium	6	3,5
6	Different states of matter: The Gaseous State: The gas laws: a. Boyle's Law b. Charles' Law c. Ideal Gas Law; kinetic theory of gases, molecular diffusion and effusion; The Liquid State: Vapor pressure and it's variation with temperature; Vaporization, Evaporation & boiling temperature of a liquid & liquid mixture; Surface tension and viscosity; Solution: Properties, Ideal and non ideal solution, solubility and it's variation with temperature and pressure; The Solid State: Crystalline and amorphous solids; Colloid: Colloidal Dispersions in Liquids; Colloidal Dispersions in Air	9	2,5
7	Acids, Bases and Salts: Introduction to Acids, Bases and Alkalis; The pH Scale; Buffered Solution; Salts and Some of their usages	4.5	3
8	Nuclear chemistry: Radioactivity: Nuclear decay, Nuclear energy; Radiation; Equation of nuclear reaction, Fission and Fusion reaction	4.5	4
9	Organic chemistry: Functional groups; Hydrocarbons and derivatives; Polarity and solubility; Reaction mechanisms: Oxidation, reduction, hydrolysis, and photochemical reactions	4.5	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Brown, T. L., Eugene, H., Bursten, B. E., Murphy, C. J., Woodward, P. M., Stoltzfus, M. W., & Lufaso, M. W. (2018). *Chemistry: the Central Science* (14th ed.). Pearson.
- Bauer, R. C., Birk, J. P., & Marks, P. S. (2016). *Introduction to Chemistry*. McGraw Hill.
- Timberlake, K. C. (2019). *Chemistry An Introduction to General, Organic, and Biological Chemistry* (13th ed.). Pearson.
- Mosher, M., & Kelter, P. (2023). *Introduction to Chemistry* (2nd ed.). Springer.

Course Code	: GETh 304
Course Name	: Rural Geography and Settlements
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a comprehensive understanding of rural geography with a focus on rural societies, economies, and settlement patterns. It examines the dynamics of rural transformation, including livelihood changes, migration, land use, and development processes. The course also explores the spatial structure and evolution of rural settlements, housing types, and the role of institutions in shaping rural landscapes. Special emphasis is given to the context of Bangladesh, linking theoretical perspectives with real-world rural development challenges.

Course Objectives

1. Introduce key concepts, theories, and approaches in rural geography.
2. Examine the socio-economic and environmental transformations in rural areas.
3. Analyse rural settlement patterns, structures, and housing characteristics.
4. Develop an understanding of rural development processes and planning perspectives.
5. Enhance students' ability to relate theoretical knowledge to the rural context of Bangladesh.

Course Learning Outcomes (CLOs)

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

1. Explain key concepts, definitions, and theoretical approaches in rural geography.
2. Analyse rural socio-economic transformations, including livelihoods, migration, and demographic changes.
3. Evaluate changes in rural land use and their environmental and developmental implications.
4. Assess the structure, functions, and evolution of rural markets and economic systems.
5. Interpret rural settlement patterns, processes of dispersion and agglomeration, and housing typologies.
6. Critically examine the role of institutions, policies, and organisations in rural development and governance.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Rural Geography: Definitions and meanings of "rural", Scope and significance of rural Geography, Evolution of Rural geography as a sub-discipline	3	1
2	Theoretical Approaches to Rural Change: Economic, social and spatial perspectives of rural changes	6	1
3	Rural Demography: Rural population dynamics, Rural migration and demographic change, Depopulation, Repopulation, Rural-urban drift	3	2

4	Rural Livelihoods: Strategy, Framework, Diversification, Vulnerability, Poverty	3	2
5	Rural Economy and Economic Systems: Rural industries, Rural periodic markets and centres, Characteristics and types of periodic markets, Periodicity and synchronisation of rural markets	6	2,4
6	Rural Landuse: Types of rural landuse, Changes in the extensive use of rural land (settlement, agricultural, forest, wetlands, etc.); Landuse and agricultural policies	3	3
7	Rural Settlements: Definition, scope and approaches of studying rural settlements; Phases and development of settlement, Factors of dispersion and agglomeration	6	5
8	Rural Housing and Settlement Morphology: Factors influencing housing form and design, Housing design and layout; Regional variations in housing characteristics	6	5
9	Rural Governance and Institutional Frameworks: Local governance structure; Role of government and NGOs in rural development; Policy frameworks and rural development planning; Rural development models	3	6
10	Rural Transformation in Bangladesh: Trends in rural transformation (economic, social, spatial, environmental, etc.), emerging challenges and prospects	6	2,3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Hudson, F. S. (1977). *A geography of settlement*. MacDonald and Evans.
- Pearson, D. (1979). *The geography of settlement*. Addison-Wesley Longman Ltd.
- Mandal, R. B. (1979). *Introduction to rural settlement*. Concept Publishing Company.
- Grigg, D., & Wrigley, D. (1982). *Settlement geography: Concepts and problems*. Holmes and McDougall.
- Woods, M. (2004). *Rural geography*. SAGE Publications.
- Clout, M. (2007). *Rural settlement and land use* (1st ed.). Routledge.
- Ilbery, B. W. (Ed.). (2014). *The geography of rural change* (Rev. ed.). Routledge.
- Yarwood, R. (2023). *Rural geographies: People, place and the countryside*. Routledge.
- বাকী, আবদুল (১৯৯৮), *গ্রামীণবসতি*, ঢাকা : বঙ্গ প্রকাশনী।

Course Code	: GEDLb 305
Course Name	: Application of Statistics in Geography and Environment
Course Type	: Practical
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

This practical course is designed to provide hands-on training in applying statistical techniques to geographical and environmental data. Students will learn to use statistical tools and software to analyze spatial and non-spatial data, interpret results, and support evidence-based decision-making in geography and environmental studies.

Course Objectives

1. Develop practical skills in statistical data analysis
2. Introduce statistical software (e.g., Excel/SPSS/R) for data handling
3. Analyse and interpret geographical datasets
4. Apply statistical methods in environmental problem-solving
5. Enhance data visualisation and reporting skills

Course Learning Outcomes (CLOs)

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

1. Organise and manage geographical datasets.
2. Construct statistical tables, graphs, and charts.
3. Apply descriptive statistical measures.
4. Perform basic inferential statistical analysis.
5. Conduct correlation and regression analysis.
6. Analyse spatial data using statistical techniques.
7. Use statistical software for data analysis.
8. Prepare and present analytical reports.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to statistical software (Excel/SPSS/R basics)	4.5	7
2	Data collection, coding, classification, and tabulation	4.5	1
3	Construction of charts, diagrams, histograms, and graphs (using Excel/SPSS)	4.5	2
4	Measures of central tendency and dispersion (practical computation)	3	3
5	Time series analysis (trend analysis using real data)	3	4
6	Probability and distribution (basic applications)	3	4
7	Hypothesis testing (t-test, chi-square) using software	6	4
8	Correlation and regression analysis using datasets	6	5

9	Spatial statistical analysis (nearest neighbour, mean centre, etc.)	3	6
10	Report writing and presentation	4.5	8

Teaching Strategies and Activities

- Hands-on computer lab sessions; Demonstration using statistical software; Dataset-based exercises
- Group work and presentations; Project-based learning
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Rogerson, P. A. (2019). *Statistical Methods for Geography*. Sage Publications
- Field, A. (2018). *Discovering Statistics Using IBM SPSS*. Sage
- O'Sullivan, D., & Unwin, D. (2014). *Geographic Information Analysis*. Wiley
- McKillup, S. (2012). *Statistics Explained*. Cambridge University Press

Course Code	: GELb 306
Course Name	: GIS: Advanced Data Concepts and Spatial Analysis
Course Type	: Practical
Course credits and marks	: 2 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course is designed to develop advanced Geographic Information System (GIS) skills at the Honours 3rd year level in the Department of Geography and Environment, University of Dhaka. It builds upon foundational GIS concepts and introduces complex tools and techniques for spatial data management, geodatabase design, and advanced spatial analysis. The course emphasises practical hands-on training in georeferencing, digitisation, topology construction, error correction, and geoprocessing using modern ESRI ArcGIS software. Students will work with real-world datasets to solve societal and environmental problems through GIS applications.

Course Objectives

The main objectives of this course are to teach students how to:

1. Design and manage complex geodatabases for advanced GIS workflows.
2. Perform accurate georeferencing and spatial transformations, including alignment of scanned maps and images.
3. Capture, digitize, and manage spatial data layers (points, lines, polygons) with high accuracy.
4. Construct topology and identify and correct spatial and topological errors.
5. Apply advanced spatial data processing and geoprocessing tools for analysis and problem-solving.
6. Evaluate spatial data quality and its impact on GIS outputs.
7. Use GIS to address real-world societal and environmental challenges.
8. Develop collaborative and professional GIS project skills.

Course Learning Outcomes (CLOs)

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

1. Design and manage complex geodatabases to support advanced GIS workflows.
2. Perform georeferencing and spatial transformations to align and analyze geographic data.
3. Identify and resolve spatial and topological errors to ensure data integrity.
4. Conduct advanced spatial analysis using geoprocessing tools, including queries, overlays, and data manipulation.
5. Digitize and manage spatial data layers (points, lines, polygons) for accurate cartographic representation.
6. Evaluate spatial data quality parameters (accuracy, resolution, consistency) and their impact on analysis.
7. Apply GIS tools to solve real-world problems in societal and environmental contexts.
8. Collaborate on geospatial projects and facilitate data sharing using GIS platforms.
9. Master advanced GIS tools and techniques for research-driven spatial analysis.
10. Develop professional GIS workflows and prepare outputs for decision-making and publication.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to GIS Workflow and Project Types	3	1,7,10
2	Building a Personal Geodatabase (Schema design, tables, relationships)	4	1
3	Importing Spatial & Attribute Data; Projection Transformations & Metadata	4	2
4	Georeferencing Images and Mouza Maps	3	2,5
5	Digitizing Point, Line, and Polygon Layers + Spatial Adjustment	3	5
6	Topology Creation, Error Identification & Correction	2	3
7	Data Quality Assessment (Positional, Attribute, Logical Consistency, Resolution)	3	6
8	Spatial Data Processing: Queries (Select by Attribute/Location), Clip, Dissolve, Union, Append	4	4
9	Advanced Geoprocessing and Overlay Analysis	5	4,7
10	Real-world Application Projects (Societal/Environmental Case Studies)	3	7,8,10
11	Collaborative Workflows, Data Sharing & Publishing Maps	3	8,10
12	Revision, Error Handling and Best Practices	2	1-10
13	Project Presentation & Viva	3	1-10

Teaching Strategies and Activities

- Hands-on practical sessions in ArcGIS lab with step-by-step guidance.
- Lecture with multimedia, interactive discussions, and demonstrations.
- Individual and group assignments on real-world GIS problems.
- Student presentations on assigned topics (e.g., case studies or project outputs).
- Field data collection (where feasible) and cloud-sourced data integration.

Reading Materials

- de Smith, M. J., Goodchild, M. F., & Longley, P. A. (2021). *Geospatial Analysis: A Comprehensive Guide* (6th ed.). Troubador Publishing.
- Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2021). *Geographic Information Systems and Science* (5th ed.). Wiley.
- Bolstad, P. (2022). *GIS Fundamentals: A First Text on Geographic Information Systems* (7th ed.). XanEdu Publishing.
- ESRI. (2023). *ArcGIS Pro: Advanced Techniques and Workflows*. Esri Press.

Course Code	: GELb 307
Course Name	: Map Reading and Interpretation
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Maps have been used for centuries to describe spatial patterns and portray association and correlation. The course 'Map Reading and Interpretation' is designed to introduce students to the fundamental concepts of mapping and to provide the opportunity to utilise developing skills in analysing existing maps to take full advantage of these maps. This is one of the core courses for Geography and Environment. The course focuses on the basic elements of map reading, analysis and thinking critically for extensive interpretation. Therefore, conscientious class attendance and adequate preparation for class work are expected.

Course Objectives

1. To provide students with a basis for making intelligent decisions concerning the use and interpretation of maps.
2. To develop knowledge, understanding and ability to analyse different types of maps as well as the information/ data from maps and interpret critically

Course Learning Outcomes (CLOs)

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

1. Understand different types of maps and their applications
2. Acquire map-reading and interpretation skills
3. Critically analyse the geographical aspects of the relationship between people and the natural environment
4. Effectively apply a range of skills in academic, professional and social settings

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Basics of map reading: Methods of Showing Relief (Pictorial, Mathematical, Combination of the two)	3	1
2	Gradient analysis: Understanding basic concepts of intervisibility, relief, cross-section, gradients, Slope Determination, Understanding Contour. Profile drawing from imaginary contour, Techniques of Slope determination	18	2
3	Interpretation of topographical maps: The Language of Maps; Marginal Information of Topographical map; Conventional Signs and Symbols; Concept of Sheet Number, Interpreting the Physical Features; Understanding the Relief and Slopes, Identifying for Physiographic Regions, Interpreting the Human/Cultural Features,	18	2,3

	General Understanding of the Land uses; Communication Network; Analysis of the Relationship between Physical and Cultural Features, Look for Spatial Patterns; Distribution, Density and Regions		
4	Interpretation of geological map: Definition, Types and Use of Geological Map; Study of Outcrop, Bedding, Unconformity, Folding, Faulting, Strike and Lineament	15	3
5	Understanding weather maps: Introduction to Weather Station, Signs and Symbols, Differences of Weather and Climatic Maps; Weather Map Interpretation	9	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Bygott, J. (1948). *An Introduction to Mapwork and Practical Geography*, University Tutorial Press.
- Shingh, R.L. (1979). *Elements of Practical Geography*, Kalyani Publishers, India.
- Ajaegbu, H.I. (1973). *A New Approach to Practical Work in Geography*, Heinemann Educational

Course Code	: GETH 308
Course Name	: Bangladesh: Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course provides an overview of the emergence of geography as a discipline in Bangladesh. The course emphasizes the geography and environment of Bangladesh through physical and human phenomena. It explores problems associated with population growth and poverty, natural resource management, climate change, disaster management and human health.

Course Objectives

1. Develop concepts on the origin and evolution of the geological processes of Bangladesh.
2. Share the ideas on various advantages and disadvantages of the existing location of the country.
3. Share the issues and challenges of different ecological systems and natural resource bases.
4. Develop ideas on existing natural hazard risk and environmental issues of the country and different management challenges.
5. Finally share practical knowledge on how sustainable development can be achieved in Bangladesh.

Course Learning Outcomes (CLOs)

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

1. Demonstrate basic aspects of the human and physical characteristics of Bangladesh.
2. Analyse natural and environmental settings, population and demographic characteristics
3. Understand and explain major natural resources, socio-economic sectors and issues of Bangladesh.
4. Explore the issues and challenges of natural hazards and disasters.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Location, Geophysical and Geopolitical Importance, History, Economy and Society	3	1
2	The Natural Environmental Setting: Geological Background, Relief and Physiography, River Systems and Wetlands, Soils and Agroecological Zones, Climate	6	1, 2
3	Population and Demographic Characteristics: Population Size, Density, Fertility, Mortality and Migration, Demographic Dividend, Human Resources, Issues and Challenges of Human Population Growth	6	2, 3
4	Major Resource Bases: Land, Water, Minerals, Fuel and Energy, Fisheries, Livestock, Forests	6	3

5	Major Economic Sectors in Bangladesh: Primary, Secondary, and Tertiary Sectors	3	3
6	Socioeconomic Issues of Bangladesh: Social Conflict, Poverty and Unemployment, Involuntary Displacement, Segregation	3	3
7	Environmental Issues of Bangladesh: Major Regions of Environmental Concern, Environmental Pollution and Degradation, Deforestation, Green-house Effects and Climate Change	9	3, 4
8	Natural Hazards and Disaster: Floods, Drought, Cyclone, Riverbank Erosion, Tectonic Hazard, Landslide, Tornado, Thunderstorm and Lightening	6	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Brammer, H. (2012). *The Physical Geography of Bangladesh*, The University Press Limited, Dhaka.
- Brammer, H. (2014). *Climate Change, Sea-Level Rise and Development in Bangladesh*, The University Press Limited, Dhaka.
- Rashid, H. (1991). *Geography of Bangladesh*, The University Press Limited, Dhaka
- Ahmed, A.F.S., Choudhury, B.M., Khan, A.M., Shahed, S.M. (eds.) (2022). *Bangladesh: Landscape, Soil Fertility and Climate Change*, The University Press Limited, Dhaka.
- Brammer, H. (2016). *Bangladesh: Landscape, Soil Fertility and Climate Change*, The University Press Limited, Dhaka.
- Rasheed, K.B.S. (2016). *Bangladesh: Resource and Environmental Profile*, AHDPH, Dhaka

Course Code	: GETh 309
Course Name	: Climatology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Climatology is a study of the Earth's climate. Climate elements and atmospheric heat transfer processes will be studied. Atmospheric properties and physical processes that determine current weather and long-term climate trends, will be discussed. Will incorporate the distribution and movement of water and air in the atmosphere. Special attention will be given to the atmospheric disturbances and severe weather. The effects of climate on human activities will be considered (emphasizing Urban Climate and Global Environmental Change). Hands-on experience will be practiced through applied climatological techniques with respect to simple analytical and statistical analysis of meteorological/climatological data.

Course Objectives

1. Provide knowledge to the students of the historical concept of Meteorology and Climatology, the Physical behavior of the atmosphere; elements of weather and climate and their distribution over the earth; understand the composition, structure and processes of earth atmosphere.
2. Describe the concepts and processes of the environment, energy, solar radiation, atmospheric motion and how they are interrelated. And also learn the optical characteristics of the atmosphere.
3. Provide knowledge about the basics of cloud development, precipitation process and measurement. Simultaneously the meteorological basics to help understand the tropical storms and hurricanes, tornadoes, lightning, thunder, and other unusual weather.
4. Examine the atmospheric circulation regimes, pressure distributions, air masses and fronts.
5. Explore earth's climate, its classification, changes of climate in the past and in the future, the variability and trends of climate, urban climate and global environmental change (the Greenhouse Effect, Global Warming, Urban Heat Islands, etc.). Simultaneously develop an awareness of the human dimensions of climate change by investigating its impacts, adaptations, and solutions at local, regional, and global scales.
6. To provide knowledge about applied sectors of climatology and related research tools and techniques (basics of climate model), the concept of weather map and weather forecasting and analysis and basics of weather radar and satellite systems.
7. Understanding, analyse and interpret the meteorological/climatological data through written and oral work (through assignments and tutorials).

Course Learning Outcomes (CLOs)

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

1. Understand the basics of atmospheric science in terms of Climatology and Meteorology; understand the composition, structure and processes of the Earth's atmosphere.

2. Explain the concept of atmospheric motion, solar radiation, seasons and energy balance of the earth, atmospheric optics.
3. Identify different types of clouds, their formation; Precipitation, its forms and measurement processes.
4. Explain the elements of climate systems, monsoons, and natural variability of climate on interannual and interdecadal scales. Paleoclimate, and future climate, climate variability and trends.
5. Identify different types of atmospheric circulation, air masses and fronts and also develop the basic concept on atmospheric disturbances and severe and unusual weather and climate phenomenon. Simultaneously will have knowledge about atmospheric phenomena unique to the tropics, and their connection to the global circulation.
6. Describe the impact of climate and extreme climate and weather events on society and societal responses to those events.
7. Learn the methods of analysing and interpretation of meteorological/climatological data in a variety of applied climatological contexts.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Atmospheric Science: Introduction and History of Meteorology and Climatology; Weather vs Climate; Components of the Climate System	3	1
2	Energy and Mass: Composition and Structure of the Atmosphere; Solar Radiation and the Seasons; Energy Balance and Temperature; Atmospheric Motion, Pressure and Wind; Atmospheric Optics	6	2
3	Water in the Atmosphere: Atmospheric Moisture; Cloud Development and Forms; Precipitation Processes, Precipitation Measurement	6	3
4	Distribution and Movement of Air: Atmospheric Circulation and Pressure Distributions; Air Masses and Fronts	4.5	5
5	Atmospheric Disturbances and Severe Weather: Midlatitude Cyclones; Lightning, Thunder, and Tornadoes; Tropical Storms and Hurricanes	7.5	5,6
6	Current, Past and Future Climate: Earth's Climates; Climate Classification; Climate Changes: Past and Future; Climatic Data, Variability and Trends of Climate; El Niño and La Niña	6	4,6
7	Urban Climate and Global Environmental Change: Atmospheric Aerosols; Ozone in the Atmosphere; The Greenhouse Effect; Global Warming; Urban Heat Islands	4.5	2,6
8	Applied Climatology: Applied Climatology, Research approaches and Tools; Weather Forecasting and Analysis; Climate and Applied Sectors of Environment- Global and Local Impact	4.5	4,6,7

Teaching Strategies and Activities

- Lecture with Multimedia, Interactive discussions, Group/Individual Assignment, Tutorial/Presentation/Quiz.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Aguado, E. & Burt, J. E. (2021). *Understanding Weather and Climate* (Seventh edition). Pearson Education, USA.
- Sammonds, P., Guppy, L., & Sun, T. (2026). *Climate and Natural Hazard Risks* (1st edition). Elsevier. Paperback. ISBN: 9780443273681.
- Barry, R. G. & Chorley, R. J. (2010). *Atmosphere, weather, and climate* (Ninth edition). Routledge. 2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN, UK.

Course Code	: GETH 310
Course Name	: Coastal Geography and Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Coastal Geography and Environment deals with an introduction and elaboration of coastal typology, morphology, ecology and human interaction with coastal environmental settings. It discusses the scope and challenges associated with coastal environments. The sustainable use of coastal resources has fundamental importance in the development of a country. This course offers a clear idea about the concept of integrated coastal zone management.

Course Objectives

1. To familiarise with basic concepts of coast and to introduce coastal resources and their management
2. To understand the coastal processes and coastal dynamics
3. To understand the concept of integrated coastal zone management.
4. To know about the characteristics and uses of coastal zones and coastal zone management issues.
5. To learn about the tools and techniques and administrative policy for ICZM.

Course Learning Outcomes (CLOs)

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

1. Explain the coastal environmental systems of the world, with particular attention to Bangladesh.
2. Understand the concept of Integrated Coastal Zone Management (ICZM) and the tools and techniques associated with it.
3. Analyse policies and key issues related to coastal zone management, particularly in the context of Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Definition and classification of coast. coastal landforms and their environmental characteristics	4.5	1
2	Coastal Process: Tide, wave, ocean currents and fluvial dynamics, Coastal sediment dynamics	6	1
3	Coastal resource, definition, classification, resource inventory, tools and techniques, resource utilisation, environmental protection	4.5	1,2
4	Coastal Land use; Coastal agriculture, Urbanisation, Industrial development, Tourism and recreation, Port and marine transportation, Aquaculture, Sea salt production	4.5	2,3
5	Coastal Disaster and Disaster management: Cyclone and	4.5	2,3

	storm, surges, tsunامي, waterlogging, coastal erosion, climate change, sea-level change, saline water intrusion, subsidence, coastal pollution		
6	Concept of ICZM , definition, scope, views and needs of ICZM, multidisciplinary approach issues of ICZM	6	2
7	Tools and Techniques for ICZM: Administrative Tools (Policy and legislation, Guidelines, Zoning); Social customary tools (Traditional practices, Collaborative and community-based management, Capacity building) and Technical tools (Coastal Engineering measures, EIA, Remote sensing and GIS, Economic analysis)	6	2,3
8	Coastal Geography of Bangladesh : Classification, characteristics, human interventions, opportunities, and environmental challenges	6	1,2,3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Beatley, T., Brower, D. J., & Schwab, A. K. (2002). *An introduction to coastal zone management*. Island Press.
- Clark, J. R. (1992). *Integrated management of coastal zone*. Food and Agriculture Organization (FAO) of the United Nations.
- Davidson-Arnott, R. (2010). *An introduction to coastal processes and geomorphology*. Cambridge University Press.
- Kay, R., & Alder, J. (2017). *Coastal planning and management*. CRC Press.
- Masselink, G., & Gehrels, R. (2014). *Coastal environments and global change*. AGU Wiley.

Course Code	: GETH 311
Course Name	: Hazard and Disaster Management
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course "Natural Hazard, Disaster, and Disaster Management" provides students with a comprehensive understanding of the concepts, principles, and strategies related to disaster management. It explores the various types of disasters, their impacts, and the key elements involved in effective disaster management. Students will gain insights into disaster preparedness, response, communication, policy, legislation, long-term measures, vulnerability analysis, and common disasters in Bangladesh. The course equips students with the knowledge and skills necessary to contribute to disaster risk reduction and management efforts.

Course Objectives

1. Define and explain fundamental disaster management concepts, types of disasters, terminologies, and key personnel roles.
2. Analyse and interpret the disaster management cycle and evaluate tools, methods, and technologies used in disaster management.
3. Develop disaster preparedness plans at the community and national levels, incorporating policies and planning prerequisites.
4. Assess disaster response strategies, relief operations, communication approaches, and the roles of different stakeholders.
5. Conduct vulnerability analysis and evaluate common disasters in Bangladesh, proposing suitable mitigation and long-term management strategies.

Course Learning Outcomes (CLOs)

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

1. Demonstrate a clear understanding of the concepts, scope, and objectives of disaster management.
2. Explain the role of a disaster manager and the responsibilities of key personnel and specialists.
3. Identify and apply the elements of disaster management in mitigating and responding to disasters.
4. Utilise the appropriate concepts and terms related to disaster management and understand the effects of different types of disasters.
5. Apply the disaster management cycle and utilise tools, methods, and technologies for effective disaster management.
6. Formulate disaster preparedness policies and prerequisites for preparedness planning.
7. Develop general preparedness plans at the national and community levels.
8. Analyse and contribute to disaster response efforts, including debunking myths and understanding the role of relief and planning.
9. Implement effective disaster communication methodologies and understand the interaction between disasters and the media.
10. Evaluate and analyse disaster management policy, legislation, and standing orders.

11. Propose and implement long-term measures for disaster management, including prevention, mitigation, recovery, and risk insurance.
12. Conduct vulnerability analysis and identify factors contributing to vulnerability in disaster-prone areas.
13. Apply appropriate management strategies for common disasters in Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Disaster Management: Definition, scope and objectives; Disaster Manager; Key personnel and specialists; Role of Disaster Manager	3	1,2
2	Concepts and terms in disaster management: Concepts and terms in disaster management; Types of disasters- Natural and Man-made disasters, effect of disaster; Disaster management cycle; Tools, methods and technologies of disaster management	6	4,5
3	Introduction to Disaster Preparedness: Definitions, disaster continuum and relationship of various time phases to each other; Formulating policies for disaster preparedness; Prerequisites for preparedness planning	6	6
4	General Preparedness Planning: National plan and plan elements; Community plan	6	6,7
5	Disaster Response: Natural disaster response: Definition, scope and other issues; Disaster myths; Disaster and disaster relief; Disaster response planning; Disaster response role and responsibilities	3	6
6	Disaster Communication: Effective disaster communication; Methodology for disaster communication; Disaster and media; Epidemiologic factors in disaster communication	6	2,3,7
7	Disaster Management Policy, Legislation and Standing Order: Disaster management national plan and policy; Disaster management legislation; Standing Orders	6	7
8	Disaster Management Long Term Measures: Prevention, mitigation and recovery; Risk insurance	4.5	3
9	Vulnerability Analysis	1.5	5
10	Common Disasters in Bangladesh	3	4

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Disaster Management Bureau. (2009). *Disaster Management Training Manual* (Vols. I–III).
- Diwan, P. (2010). *A Manual on Disaster Management*.
- Carter, W. N. (1997). *Disaster Management: Disaster Manager's Handbook*.
- CARE-BANGLADESH. (2009). *Disaster Manuals 1 (Short) & 2 (Long)*. Dhaka.

Course Code	: GELb 312
Course Name	: Remote Sensing: Image Processing and Analysis
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The need for image processing and analysis of remote sensing data is inclined to the improvement of pictorial information for human interpretation and the processing of scene data for autonomous machine perception.

Course Objectives

1. To equip students with the ability to interpret raw satellite images for effective processing and analysis.
2. Introduce and familiarise students with various tools and techniques used in digital image processing and analysis.
3. Developing students' capability to perform image rectification and enhancement tasks with precision.
4. Enabling students to apply remote sensing techniques to analyse diverse topics of environmental and societal concern.
5. Building proficiency in performing image classification and calculating indices to extract meaningful insights.
6. Enhancing students' understanding of the spatial and spectral characteristics of satellite imagery for accurate interpretation.
7. Training students to integrate remote sensing data with GIS for advanced spatial analysis.
8. Fostering critical thinking skills for solving real-world problems using remote sensing applications.
9. Promoting awareness of ethical considerations and sustainability in the use of satellite data and remote sensing technology.
10. Preparing students for advanced research or professional careers in remote sensing, GIS, and related fields.

Course Learning Outcomes (CLOs)

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

1. Demonstrate a solid understanding of the fundamentals of digital image processing systems.
2. Perform restoration and rectification of satellite images to ensure their accuracy and usability.
3. Apply image enhancement techniques to improve the visual and analytical quality of satellite images.
4. Execute classification of satellite images and generate indices to extract meaningful insights.
5. Utilise Principal Component Analysis (PCA) and image transformation techniques for advanced image analysis.
6. Evaluate various aspects and perform assessments of thermal and microwave satellite images.
7. Integrate remote sensing techniques with GIS for effective spatial data analysis.

8. Design and implement workflows for preprocessing and analysing multispectral and hyperspectral satellite data.
9. Analyse environmental and societal challenges using satellite imagery and remote sensing methodologies.
10. Develop a comprehensive understanding of current trends and advancements in digital image processing and remote sensing technologies.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Digital Image and Image Processing System Introduction to digital image processing: Concept of digital image, steps in DIP. Image processing systems –hardware and software considerations. Digitization of photographic image, converting digital image to visual form image. Digital image data formats, Image data storage and retrieval. Labs: A) Introduction with Software B) Image Data Format and Exchange/Import	6	1
2	Image Restoration and Rectification Radiometric correction of remotely sensed data Geometric correction of remotely sensed data. Image registration – definition principle and procedure. Basic statistical concepts in DIP and use of probability methods in DIP. Labs: A) Image Registration B) Radiometric and Geometric Correction of Image C) Basic Statistics of Image	12	2
3	Image Enhancement and Analysis Image enhancement Techniques - an overview Contrast Enhancement - Linear and nonlinear, Histogram equalization and Density slicing Spatial filtering and Edge enhancement Multi image manipulation – addition, subtraction and Band rationing Labs: A) Image Enhancement (various types) B) Spatial Filtering (different types) C) Band ratio analysis and comparison	9	3
4	Image Classification and Indices Unsupervised classification: advantage, disadvantage and limitations. Supervised classification: training site selection, sampling, Classifiers, maximum likelihood. Accuracy assessment. Indices: NDVI, NDWI, NDBI Labs: A) Image Classification (Supervised and Unsupervised) B) Classification Accuracy Assessment C) Exercise on Image Classification (based on research articles)	15	4,8,9,10
5	Principal Component Analysis and Image Transformation Basics on Principal Component Analysis Enhancement by using colors – advantages, Types of color enhancements. BGR – coding	9	5,6

	and generation of FCC's Image transformation – Intensity Hue Saturation (HIS) Labs: A) PCA Analysis B) BGR and FCC image generation and analysis C) Image transformation		
6	Thermal and microwave remote sensing Thermal radiation principles, thermal process, interactions and properties. Concepts and principles of microwave remote sensing. Fundamentals of radar and LIDAR data Land Surface Temperature (LST) and Sea Surface Temperature (SST). Labs: A) Interpretation of thermal and microwave images B) Assessment of radar and LIDAR images C) Analysis of LST and SST data	12	6,7,8,9,10

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Allen and Gupta, R.P. (1990). *Remote Sensing Geology*. Springer Verlag
- Gibson, P.J. (2000). *Digital Image Processing*. Rutledge Publication
- Jensen, J.R. (2021). *Introductory Digital Image Processing: A Remote Sensing Perspective* (4th ed.). Pearson Publication.
- Richards, J.A. (2022). *Remote Sensing: Digital Image Analysis*. Springer Nature.

Course Code	: GELb 313
Course Name	: Research and Fieldwork in Physical Geography and Environment
Course Type	: Practical (Fieldwork)
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Effective study in physical geography requires intensive investigation in the field. This course offers students the opportunity to conduct field-based activities aiming to collect data on various hydro-morpho-ecological regions following a systematic research methodology.

Course Objectives

1. Aiming to develop the competency among the students to formulate a comprehensive field plan for physical geographical investigation.
2. Aiming to develop skills to operate and use various tools and techniques in the field to collect hydro-morpho-ecological data.
3. Aiming to develop the skill in data analysis and scientific report writing.

Course Learning Outcomes (CLOs)

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

1. Develop a comprehensive fieldwork plan using appropriate methods and tools.
2. Collect primary data systematically from the field following established protocols.
3. Analyse field data and prepare clear, well-structured reports based on the findings.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Research in Physical Geography: Types, Characteristics, Methodology, Selection of Research Topic, Research Design	6	1
2	Fieldwork in Physical Geography: Needs of Fieldwork in Physical Geography; Site Selection; Field plan; Fieldwork Preparation, Supports	4.5	1
3	Geomorphological Mapping: Topographical Survey; Identification of Geomorphological Units; Preparation of geomorphological maps. Map interpretation	4.5	2
4	Hydrological Survey: Measurements of River flow; River-cross section analysis, River bed sediment collection and field description; Ocean/Lake survey, Data Processing; Data Analysis	4.5	2
5	Profile/Out-crop Study: Preparation of section/out-crop cleaning, identification of layers/beds; Description of sediment in the field after Troels-Smith Scheme; Application of Monolith, Graphical and Match stick techniques in the field; Use of Munsell Colour Chart in the field; Lithostratigraphy and DCP Survey	4.5	2
6	Borehole Study; Site selection for borehole; Description of	4.5	2

	borehole sediment in the field after the Troels-Smith Scheme		
7	Slope Analysis: Measurement of Hill slope by Trigonometric method; direct measurement of slope using slope meter; Limitation	4.5	2
8	Vegetation Survey: Vegetation survey by quadrant method; Species identification with reference to different land levels; Study the relationship of vegetation species with soil type; Ecological Survey	4.5	2
9	Report writing: Data analysis, data presentation. Preparation of Report	4.5	3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Islam, M. Shahidul, Rahman, M. Maksudur, Kabir, Md. Humayun, & Islam, Md. Serajul (Eds.). (2018). *Learning Geography and Environment in the Field*. Department of Geography and Environment, University of Dhaka.
- Goudie, A. (1990). *Techniques in Physical Geography*. Routledge.

Course Code	: GETH 401
Course Name	: Advanced Research Methodology
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course is intended to provide a basic foundation in research when students are at the terminal stage of their bachelor's degree. Students are expected to learn innovative research methods, techniques and strategies for investigating both human and physical geography. The course will also help students understand how to conduct independent research by drawing on their experience from laboratory and fieldwork.

Course Objectives

1. Provide an overview of the scientific nature of research, epistemology and controversies in research methods in geography and environment.
2. Prepare students to conceptualise research problems in both human and physical geography and the environment.
3. Familiarise students with various types of research strategies and techniques in both qualitative and quantitative methods.
4. Orient students to data measurement, classification and explanation.
5. Teach students how to prepare a research report based on data analysis, interpretation and presentation.
6. Develop students' knowledge of how to write a report and present results and findings.
7. Develop fundamental geographic research concepts for students who wish to carry out empirical research on human and physical phenomena or an integration of both.

Course Learning Outcomes (CLOs)

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

1. Understand the fundamental concepts of scientific research in geography and environment.
2. Be familiar with methodological controversies in geographic investigation.
3. Understand pragmatism and descriptive sciences.
4. Differentiate between research methods in human and physical geography, along with their unique strategies and techniques.
5. Understand the measurement, classification and explanation of geographic data.
6. Understand the process of writing a proposal for MS/MPhil/PhD studies.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	An Overview of Scientific Research: Epistemology, Methodology and Method, Procedure of Scientific Research, Methodological Controversies and Scientific Research, Defining Research Problem and Formulating Hypothesis, Research Proposal; Research Design: Conceptualisation, Formulation, Scheduling and Budgeting	6	1, 2
2	Pragmatism and Descriptive Sciences: Nature of Geographical Data, Sources of Geographical Data in different Branches of Geography, Review of Literature	6	3
3	Research Methods in Human Geography: Sampling, Need for Sampling, Determining the Size of Sampling, Sampling Errors, Methods of Data Collection: Observation, Questionnaire, Interviews, FGD, RRA, PRA, etc., Field Techniques and Norms, Action Research, Participatory Research, Research Tools and Techniques: Remote Sensing, GIS Tools and Cartography	9	4
4	Research Methods in Physical Geography: Fieldwork: Site Selection, Field Plan, Field Techniques, Field Data Collection, Preservation, Laboratory Work: Data Preservation, Data Processing, Methods of Laboratory Analysis	9	4
5	Measurement, Classification and Explanations: Measurement and Scaling of Data, Sources of Error, Classification and Tabulation and Interpretation of Data. <i>Explanation and Analysis:</i> Tables, Maps, Figures, Photos. Linking Empirical Evidence with Hypotheses, Theories and Models	6	5
6	Writing Research Report: Structure of a Research Report, Layout and Design of a Report, Citation and Writing References, Utilisation of Research Findings, Synopsis and Abstract, Data Presentation Techniques: Tables, Graphics, Maps, Drafting and Editing, Production and Binding	6	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Clifford, N., French, S., & Valentine, G. (2010). *Key Methods in Geography*. Sage.
- Clifford, N., Cope, M., & Gillespie, T. (2023). *Key Methods in Geography*. Sage.
- Kothari, C. R., & Carg, G. (2024). *Research Methodology: Methods and Techniques*. New Age International Publishers.
- Mason, J. (2002). *Qualitative Researching* (2nd ed.). Sage Publications.

Course Code	: GETH 402
Course Name	: Ocean and Marine Environment
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Due to its spatial location at the northern edge of the Bay of Bengal, Bangladesh deserves special attention to study the importance of the sea on its sustainable development. Scientific knowledge about the marine processes, extraction of marine resources and conservation of marine ecology are integral parts of geographical investigation. This particular course on Oceanography and Marine environment offers the students an opportunity to understand the physical, chemical and biological oceanography of the world in general and Bay of Bengal in particular. The knowledge acquired by the students from this course will help to develop their career in ocean science and management and also to find suitable jobs in the allied field both at home and abroad.

Course Objectives

1. Understanding the scope of ocean science, how this discipline requires a multi-disciplinary approach to study and the need for conservation of the marine environment.
2. Acquiring precise knowledge about the topographic conditions of the world ocean floor, particularly about the Bay of Bengal.
3. Acquiring knowledge about ocean dynamics, land ocean interface and how such processes are related to human interventions, and global climate change. Understanding the science of ocean-based hazards and the management of marine disasters, both natural and man-made.
4. Acquiring knowledge about the ocean environment, human intervention in ocean ecology, and the impact of climate change.
5. Understanding the regulation of ocean resources, ocean policies and the law of the sea and their application in Bangladesh.

Course Learning Outcomes (CLOs)

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

1. Understand the fundamental processes operating in the coastal and marine environment.
2. Understand and analyse the complex interaction between the coastal and marine environment and their resources.
3. Develop their capacity and skills on coastal and marine resource management, integrated coastal zone management and exploring the potential of the blue economy in the context of the Bay of Bengal.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Oceanography: Definition, Scope and relation with other subjects. Historical development, Oceanography in Bangladesh	6	1
2	Relief of the Ocean: Continental Shelves and Slope, Ocean floor of the Pacific, Atlantic and Indian Ocean, Bay of Bengal	4.5	1
3	Ocean Sediments: Source of Sediments, Types, Characteristics, Depositional Environments	4.5	1,2
4	Ocean Environment: Temperature, temp changes, Causes, Vertical and Horizontal Distribution, Ocean Salinity: Salinity Change, Causes, Distribution and Implication. Marine climatic Zone, Climate Change, EL-Nino, La-Nina	4.5	2
5	Ocean Dynamics: Ocean current: Causes, Types, Ocean Current in the Pacific, Atlantic and Indian Ocean. Tide: Causes and Effects, distribution. Waves: Causes, Characteristics, Wave Actions	4.5	1,2
6	Ocean Disaster: Tsunami: definition Causes, distribution, management	3	2,3
7	Sea-level Change: Definition, Causes, Past, Present and Future Trends, Consequences of Sea level changes	3	2,3
8	Marine Pollution: Definition, Sources of pollution, Global distribution, Bay of Bengal	3	2
9	Ocean Resources: Fisheries, Minerals and Power resources, Marine resources of Bangladesh. Coral Reef: Types, Formation, Characteristics, Importance and Global distribution, Resource Management	4.5	3
10	Ocean Policy: Law of the Sea, EEZ of Bangladesh. Ocean policy on Bay of Bengal. Delineation of Ocean boundary, Geopolitics on Bay of Bengal, Marine Special Planning	4.5	3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- King, C. (1966). *An introduction to oceanography*. McGraw Hill Book Co.
- Jochum, M., & Murtugudde, R. (2006). *Physical oceanography developments since 1950*. Springer.
- Micallef, A., Krastel, S., & Savini, A. (2018). *Submarine geomorphology*. Springer.
- Pathick, P. A. (1986). *Introduction to coastal geomorphology*. Edward Arnold.
- Pickard, G. L., & Emery, W. J. (1982). *Descriptive Physical Oceanography*. Pergamon Press.
- Islam, M. S. (2001). *Sea-Level Changes of Bangladesh: Last Ten Thousand Years*.
- Segar, D. A., Kish, S. W., & Mills, E. W. (2018). *Ocean studies: Introduction to oceanography* (4th ed.). American Meteorological Society.
- Talley, L., Pickard, G. L., Emery, W. J., & Swift, J. H. (2011). *Descriptive physical oceanography: An introduction*. Elsevier.

Course Code	: GETH 403
Course Name	: Urban Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course will help students understand how cities grow and how they play a vital role in shaping a country's economy through the processes of urbanisation. The urban geography course outlines contemporary theories and models explaining the internal structure of cities, urban ecology and land-use patterns, the arrangement and hierarchy of settlements, population gradients, and urban transformation. Students are encouraged to examine urban issues and challenges in both developed and developing countries through lectures, assignments, and discussions.

Course Objectives

1. Introduce the definitions, concepts, scope and approaches of urban geography. This will help students understand the evolving nature of urban concepts and approaches..
2. Identify early civilisations and their roots in urban agglomeration, including medieval, industrial, and modern cities. Emphasis will be placed on the factors that influence the growth of these cities.
3. Illustrate how urbanisation occurs in both developed and developing regions. In this way, students will be able to differentiate the patterns and processes of urbanisation, along with their characteristics and challenges for sustainable urban growth.
4. Highlight various theories and models associated with urban geography that can be applied to the analysis of real-world urban issues.
5. Discuss urban economy, population, society, culture, and politics, recognising that these are fundamental aspects of everyday life.

Course Learning Outcomes (CLOs)

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

1. Understand contemporary concepts and theories of urban geography.
2. Explain how cities have developed from ancient to modern times.
3. Analyse the key challenges and issues of urbanisation.
4. Examine various land-use models and compare them with urban structures at national, regional, and international levels.
5. Describe urban population, economy, society, culture and politics.
6. Evaluate the relationship between urbanisation and the environment in developed and developing countries.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Definition, Subject-matter, Approaches, Scope and Development of Urban Geography	3	1
2	Origin of Cities: Early Urban Hearths, Pre-industrial, Industrial and Modern Cities	3	1
3	Growth of Cities: Stages, Processes and Factors of Urban Growth (Centripetal and Centrifugal Forces)	3	2
4	Urbanisation and Urban Growth: Urbanisation Curve, Patterns and Processes of Urbanisation in Less-developed, Developing and Developed Countries	6	3
5	Internal Structure of Cities: CBD, Core-Frame Concept, Commercial Areas, Residential Zonation, Segregation, Inequality and Urban Poverty	6	4
6	Urban Land use Theories and Models: Bid-Rent Theory, Concentric Zone Model, Sector Theory, Multiple Nuclei Theory, Social Area Analysis	6	4
7	Hierarchy of Urban Centers: Central Place Theory, Rank-Size Rule, Primate City and Urban Primacy	3	4
8	Urban Population: Characteristics and Dynamics, Net and Gross Density, Density Gradient Models	3	5
9	Urban Economic Base: Basic and Non-Basic Concepts, Formal and Informal Sectors	3	5
10	Sub-urbanisation: Rural-Urban Fringe, Urban Sprawl, Satellite Town, Urban Decay	3	3, 6
11	Urban Environment: Concepts, Problems, Scale of Challenges, Management and Planning	3	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Kaplan, D., & Halloway, S. R. (2024). *Urban Geography* (4th ed.). Wiley.
- Knox, P. L., & McCarthy, L. M. (2012). *Urbanization: An Introduction to Urban Geography*. Prentice Hall.
- Jonas, A. E. G., McCann, E., & Thomas, M. (2015). *Urban Geography: A Critical Introduction*. Wiley-Blackwell.
- Pacione, M. (2009). *Urban Geography: A Global Perspectives* (3rd ed.). Routledge.

Course Code	: GETh 404
Course Name	: Agricultural Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

Agricultural geography is a sub-discipline of human geography concerned with the natural, economic, and social interrelationships associated with the alteration of the earth for plant cultivation and animal farming, with particular emphasis on their spatial characteristics. This course focuses on the history and present practice of agriculture by discussing different models. It also explores different agricultural systems in various regions and, finally, focuses on the Bangladesh perspective of agricultural activities, trends, and government policy. The study of Agricultural Geography is important as the country's economy is mostly reliant on agriculture.

Course Objectives

1. To explain how different kinds of agriculture originated and were distributed over the earth, and how they function in spatial arrangement.
2. To understand how particular types of agriculture have developed in specific areas and how they are similar to or different from farming in other areas.
3. To analyse the operation of farming systems and the changes they undergo.
4. To highlight the direction and volume of changes taking place in agriculture.
5. To demarcate the crop production regions, crop combination regions, or agricultural enterprise regions.
6. To study and examine the theories and models developed in agricultural geography.
7. To identify weaker areas in terms of agricultural productivity.
8. To delimit the nature, character, trend, and crop production of agriculture in Bangladesh.

Course Learning Outcomes (CLOs)

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

1. Be aware of the origin and history of agriculture, domestication, and diffusion of crops and animals during different time periods of human civilisation.
2. Be familiar and concerned with the emerging issues of agriculture and the determinants of agricultural patterns.
3. Learn the importance of achieving sustainability through sound agricultural systems applied at local, regional, and global levels.
4. Learn different agricultural models and their significance, limitations, and criticisms.
5. Learn about recent trends of agriculture in Bangladesh, and government policies and plans to combat food insecurity due to the emerging threat of climate change.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Agricultural Geography: Definition and Scope; Approaches, Methods, Themes and Concepts	4.5	1
2	Agricultural Origin, Development and Diffusion: Plants, Animals and Technology; Hypothesis of Agricultural origin; Major Genecenters of agriculture; Domestication of Animals; Diffusion of Cultivation of Crops and Spread of Animals during Different Periods; Development and spread of Agricultural Technology	7.5	1
3	Determinants of Agricultural Patterns: <i>Physical Determinants</i> - Terrain, Climate, Soil, Water resource, Forest cover; <i>Socio-economic Determinants</i> - Land, Labour, Capital and Scale of Production; Ownership, Tenancy, Farm Size; Transportation and Marketing, Processing and Storing; Accessibility to Roads and Market, Rural Service Center, Political policy, Intensification; <i>Technological Determinants</i> —Irrigation, Mechanization, Traditional and mechanical Input, Biochemical Input, levels of Agricultural Modernization	6	2
4	Models in Agriculture: Significance of Agricultural Models; Different Models in Agriculture with Limitations and Criticisms: Crop Combination Regions (Weaver Model); Input-Output Relationships; Agricultural location in relation to market distance - Function and land use (Von Thunen); Decision-Making under risk and Uncertainty (Game Theory Model); Diffusion concept in agriculture	9	4
5	Regionalisation of Agricultural Pattern: Agricultural Regionalisation – Concept, Techniques and Methodology of agricultural regionalisation; Agricultural Types – Concept, Methodology and Bases of Typology of Agriculture; Agricultural systems of the World (Whittlesey"s)	7.5	3
6	Agriculture in Bangladesh: Nature and characteristics, Classification, Patterns, Landuse; Crop Diversification and Intensity; Recent Trends of agriculture; Govt. Policies and climate change; Food security and prosperity of Agriculture in Bangladesh	7.5	5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Morgan, W. B., & Munton, R. J. C. (2023). *Agricultural geography*. Routledge.
- Symons, L. (2019). *Agricultural geography*. Routledge.
- Spedding, C. (2012). *An introduction to agricultural systems*. Springer Science & Business Media.
- Habiba, U., Abedin, M. A., Hassan, A. W. R., & Shaw, R. (Eds.). (2015). *Food security and risk reduction in Bangladesh*. Springer Japan.
- Brammer, H. (1997). *Agricultural development possibilities in Bangladesh*. University Press Ltd.
- Hosain, M. (2007). *Agricultural Geography*. Rawat Publications.

- Faruquee, R. (1998). *Bangladesh agriculture in the 21st century*. University Press Ltd.
- Grigg, D. (2003). *An introduction to agricultural geography*. Routledge.
- Karim, Z., Hussain, S. G., & Ahmed, A. U. (1999). Climate change vulnerability of crop agriculture. In *Vulnerability and adaptation to climate change for Bangladesh* (pp. 39–54). Springer.
- Nazir, A., & Lohano, H. D. (2022). Resilience through crop diversification in Pakistan. In *Climate Change and Community Resilience* (pp. 431–442). Springer.
- Ninan, K. N., & Bedamatta, S. (2012). *Climate Change, Agriculture, Poverty, and Livelihoods: A Status Report*. Institute for Social and Economic Change.

Course Code	: GETH 405
Course Name	: Environmental Planning and Management
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course entitled 'Environmental Pollution and Management' is very pragmatic and important, with growing concerns over environmental processes in different parts of the world. The course is intended to focus on the emerging issues and challenges of the environment and to emphasise achieving sustainability through sound environmental management at local, regional and global levels. Students are expected to learn about the different sources of pollution and different approaches and methods of efficient environmental management, both theoretically and practically. They are also expected to better contribute to the respective sectors after the successful completion of the course.

Course Objectives

1. Equipping students with knowledge to identify the basic types of environmental planning.
2. Sharing insights into the types and strategies of environmental planning.
3. Developing students' understanding of various tools, techniques, and methods used in environmental analysis.
4. Introducing best practices in environmental management from different regions of the world to inspire sustainable solutions.
5. Raising awareness about environmental concerns in Bangladesh and provide practical knowledge for achieving efficient environmental management.
6. Encouraging students to critically evaluate the impact of human activities on natural systems and promote sustainable practices.
7. Enabling students to understand the interdisciplinary nature of environmental science and the integration of various approaches for addressing complex environmental problems.
8. Cultivating leadership qualities in students for driving positive change and implementing environmental management solutions on local, national, and global scales.

Course Learning Outcomes (CLOs)

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

1. Increase students' awareness of the growing concerns related to environmental processes in different regions of the world.
2. Develop an understanding of the various types of environmental planning and their associated strategies.
3. Equip students with both theoretical and practical knowledge on various approaches and methods for efficient environmental management.
4. Expose students to best practices in environmental management from different parts of the world, fostering the adoption of successful strategies for sustainable development.
5. Enable students to evaluate and address environmental challenges, focusing on pollution reduction and sustainable resource management across different environmental contexts.

6. Strengthen students' understanding of interdisciplinary approaches in environmental management, integrating concepts from economics, policy, and science for sustainable solutions.
7. Provide students with the skills to design, implement, and assess environmental management strategies that can be applied in various sectors, both locally and globally.
8. Foster a comprehensive understanding of the role of global environmental policies and regulations in shaping sustainable practices and mitigating environmental risks.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Environment Planning, meaning, scope and approaches	3	1
2	Different types and strategies of environmental planning: Strategic environmental management, Environmental planning framework, Understanding environmental problems, Analysis of 4Ms of industries, Assessment of corporate attitude towards environmental management, System transformation process	9	2
3	Environmental Management: Theory, Principles and Key Environmental components; Scope and approaches to environmental management	9	3
4	Environmental Protection Principles: Concept of sustainability and sustainable development goals, Environment and Development dichotomy, Polluter Pays Principle, Precautionary equity, Human rights	9	4
5	Economics of the Environment: Environmental value, Economics of environmental pollution, emerging economic aspects due to environmental degradation, Paradigm shift from growth-based economy to environmental protection approach	6	4,5
6	Practices of Environmental Management: Environmental pollution and waste management, Tourism and environmental management, Urban environmental management (UEM), Good practices of UEM, Ecosystem planning and management	9	6,7
7	Environmental Hazards and Risk Assessment: Defining hazards, vulnerability, risk and exposure, Natural and man-made hazards, Pressure and Release Model (PAR), Access Model, Methods for an integrated risk assessment, Regions of risk model, Place of vulnerability model	9	7
8	Environmental Management Practices in Bangladesh: Contemporary environmental concerns, Practices of environmental management, Policies and Conservation of the environment in Bangladesh	9	7,8

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Barrow, C. J. (2005). *Environmental Management and Development*. Routledge.
- Beder, S. (2006). *Environmental Principles and Policies: An Interdisciplinary Introduction*. Earthscan.
- Madu, C. N. (2007). *Environmental Planning and Management*. Imperial College Press.
- Sankar, A. R. N. (2015). *Environmental Management*. Oxford University Press.
- Theodore, M. K., & Theodore, L. (2024). *Introduction to Environmental Management*. CRC Press.

Course Code	: GELb 406
Course Name	: Application of GIS and Remote Sensing
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The applications of GIS (Geographic Information Systems) and Remote Sensing provide powerful tools for identifying, analysing, and managing a wide range of geographical and environmental issues. GIS facilitates the storage, organisation, analysis, and visualisation of spatial data, while Remote Sensing provides continuous and reliable earth observation data. This practical course emphasises hands-on training in applying geospatial technologies to real-world problems in resource management, environmental monitoring, and decision-making

Course Objectives

The objectives of this course are to:

- Familiarise students with practical applications of GIS and Remote Sensing
- Develop skills to analyse real-world geographical and environmental problems
- Provide hands-on experience in spatial data handling and interpretation
- Enable students to conduct applied research and project-based analysis
- Enhance decision-making skills using geospatial technologies

Course Learning Outcomes (CLOs)

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

- Understand the practical applications of GIS and Remote Sensing.
- Prepare and manage spatial datasets for analysis.
- Apply GIS techniques in water resource and environmental management.
- Analyse risk, hazard, and disaster-related spatial data.
- Perform land use/land cover and change detection analysis and apply geo-spatial skills in urban planning.
- Assess pollution and environmental quality using geospatial tools.
- Analyse biodiversity and ecological patterns.
- Apply GIS in health care, administration, and planning.
- Conduct coastal and marine spatial analysis.
- Design and execute a GIS-based project integrating multiple techniques.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Spatial Data Preparation, Database Management & Data Models in GIS and RS	9	1,2
2	Environmental & Resource Management Applications	12	3,6,7,10
3	GIS and Health Applications	7.5	8,10
4	Risk, Hazard & Disaster Management Applications	9	4,10
5	Land Use/Land Cover Analysis & Change Detection and Prediction	9	5,10
6	Application of GIS and RS in Urban Analysis and Planning	7.5	5,10
7	Coastal and Marine GIS Applications	9	9,10

Teaching Strategies and Activities

- Hands-on laboratory work using GIS and Remote Sensing software
- Demonstration-based learning and guided exercises
- Interactive discussions and problem-solving sessions
- Group/individual assignments and presentations
- Project-based learning

Reading Materials

- Morton, J. C. (2019). *Image Analysis, Classification and Change Detection in Remote Sensing*. CRC Press.
- Srivastava, P. K., Mukherjee, S., Gupta, M., & Islam, T. (Eds.). (2014). *Remote Sensing Applications in Environmental Research*. Springer.
- Brian, T. (2020). *Geographical Information Systems (GIS) for Disaster Management*. Routledge.
- Massimo, C., & Ravi, M. (2019). *GIS in Public Health Practice*. CRC Press.
- Monika, K., & Mehtab, S. (2020). *Geographical Information System and Crime Mapping*. CRC Press.
- Martin, V. M., Javier, M., & Johannes, F. (2019). *GIS in Sustainable Urban Planning and Management*. CRC Press.
- Wang, Y. (Ed.). (2017). *Remote Sensing of Coastal Environments*. CRC Press.

Course Code	: GETh 407
Course Name	: Political Geography
Course Type	: Practical
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a comprehensive understanding of Political Geography, focusing on the spatial dimensions of political processes, state formation, and geopolitical dynamics. It explores key concepts such as nation-state, territoriality, geopolitical theories, and global political patterns. Special emphasis is given to Bangladesh's geopolitical position, regional relations, and contemporary global issues.

Course Objectives

The objectives of this course are to:

- Introduce fundamental concepts, theories, and approaches of Political Geography
- Analyse the evolution and nature of the state and nation-state system
- Examine global geopolitical patterns, ideologies, and practices
- Understand the role of geography in international relations and conflicts
- Evaluate Bangladesh's geopolitical position and challenges
- Develop analytical and critical thinking skills regarding geopolitical issues

Course Learning Outcomes (CLOs)

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

- Explain key concepts, nature, and scope of Political Geography.
- Analyse the evolution and characteristics of states and nation-states.
- Interpret global geopolitical patterns and ideological divisions.
- Evaluate geopolitical theories and their applications in global politics.
- Assess international relations, conflicts, and balance of power.
- Examine Bangladesh's geopolitical issues and regional significance.
- Analyse the role of international organisations and foreign policies.
- Evaluate the impact of colonialism and decolonisation.
- Analyse boundary issues, territorial disputes, and electoral geography.
- Develop critical thinking for solving contemporary geopolitical problems.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Background of Political Geography: Definition, scope, and importance	3	1
2	Nature, approaches, and schools of Political Geography	3	1
3	State concept: Nation, nation-state, evolution of state	4	2
4	Types of states: multinational, buffer, neutralized states	3	2,9
5	State as a political unit: territory, population, sovereignty	3	2
6	Geographic factors: location, resources, population and power	4	3
7	World geopolitical patterns: colonialism, capitalism, socialism	4	3,8
8	Developed vs developing world and global inequalities	3	3
9	Geopolitical practices: balance of power, sphere of influence	4	4,5
10	International relations, foreign policy, and conflicts	3	5,7
11	International organizations: UN, SAARC, ASEAN	3	7
12	Bangladesh's geopolitical situation and challenges	3	6
13	Case studies: global and regional geopolitical issues	2	10

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Flint, C., & Taylor, P. J. (2018). *Political Geography: World-Economy, Nation-State and Locality* (7th ed.). Routledge.
- Jones, M., Jones, R., Woods, M., & Whitehead, M. (2021). *An Introduction to Political Geography* (2nd ed.). Routledge.
- Hossain, M. A. (2021). *Bangladesh in South Asia: Geopolitics and Regional Relations*. University Press Limited.

Course Code	: GETH 408
Course Name	: Transport Geography
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The course provides a comprehensive overview of transport geography by assessing the spatial movement of people and goods and examining how transportation systems interact with other disciplines. It delves into theories of transportation growth on regional and global scales, analysing the differentiation and impact of urban and rural transport systems, modes of transport, accessibility and historical development. The course emphasises sustainable transportation in Bangladesh, aligning with Sustainable Development Goals and examines network analysis theories to evaluate connectivity and efficiency. Through discussions on policies, projects and planning, the course equips students with knowledge to understand and promote spatial and temporal development in the context of modernisation.

Course Objectives

1. Develop a clear understanding of the emergence and evolution of transport geography as a discipline.
2. Stimulate critical thinking on theoretical frameworks and debates in transport geography while fostering a deep understanding of historical developments, model-based approaches, and logical, empirical studies to enhance analytical skills
3. Familiarise students with major global and regional transformations and their influence on transport systems.
4. Develop research-oriented minds among young scholars to address transport challenges and solutions.

Course Learning Outcomes (CLOs)

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

1. Demonstrate a comprehensive understanding of the evolution, contemporary approaches and interdisciplinary nature of transport geography.
2. Analyse the physical and socio-economic factors influencing transportation systems and their interrelation with human activities.
3. Apply theoretical frameworks, spatial interaction models, and network analysis techniques to explore the complexities of transport systems.
4. Utilise geographical tools and methodologies, such as GIS and transport corridor analysis, for planning and sustainable management of transportation systems.
5. Engage with national and international transport policies, including sustainability initiatives and regional development plans.
6. Exhibit professional and research-oriented skills necessary for advancing knowledge in transport geography and contributing to sustainable development.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Transport Geography: Definition, scope, and importance of transport geography; The relationship of transport geography with other disciplines; Historical development of transportation systems; Overview of transportation systems in the global and regional Context	6	1
2	Factors and Morphological Modes of Transport System: <i>Factors Influencing Transport Systems:</i> (Physical, Social, Economic, and Environmental); <i>Morphological Models of Transport Systems</i> (Study of network patterns such as radial, grid, and hub-and-spoke models and the type of modes, including inland, waterway and Airway transport systems); <i>Evolution and Growth of Transport Networks:</i> (Analysis of historical and contemporary trends in transport system development)	7.5	2
3	Theories and Models in Transport Geography: Taaffe, Morrill, and Gould Model; Vance Model; Rimmer Model; Ullman's Spatial Interaction Theory; Rodrigue's Model of Transport Corridors; Hurst's Model of Network Expansion	7.5	3
4	Urban and Rural Transport Systems: Characteristics and Challenges	4.5	4
5	Network Analysis in Transport Systems: Network structure: nodes, links, and flows; Graph theory and its applications in transport geography; Accessibility and connectivity measures; Real-world applications in regional and international transport networks	6	4,5
6	Transportation System in Bangladesh: Historical Development of Transport System (Early and Mughal Period, Colonial Period, Pakistan Period and Post-Independence Period); Development of various Modes of Transport in Bangladesh; Urban and Rural Transportation Systems in Bangladesh; Globalisation, Trade and Transport in Bangladesh; Transport System Development Projects, Policies and Planning in Bangladesh	7.5	6
7	Environmental and Sustainable Transport System	3	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Hoyle, B. S., & Knowles, R. D. (1998). *Modern Transport Geography* (2nd ed.). Wiley.
- Rodrigue, J.-P., Comtois, C., & Slack, B. (2020). *The Geography of Transport Systems* (5th ed.). Routledge.
- Saxena, H. M. (2010). *Transport Geography*. Rawat Publications.
- Taaffe, E. J., Morrill, R. L., & Gould, P. R. (1996). *Geography of Transportation*. Prentice Hall.
- White, H. P., & Senior, M. L. (1983). *Transport Geography*. Longman.

Course Code	: GETH 409
Course Name	: Regional Geography of South Asia
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

The major focus of the course is to portray the physical, environmental and socio-economic aspects of South Asia. The livelihood pattern, culture, industry and trade of South Asia are also emphasised in this course. This course also comprises the origin, aims and visions of SAARC as a regional organisation in South Asia.

Course Objectives

1. Introduce the basic information of South Asia as a unique region.
2. Understand the physical settings of South Asia along with its climate, soil and vegetation characteristics.
3. Portray the changes in the cultural environment, focusing on the ethnic and population dynamics.
4. Highlight the pattern of economic activities with a major focus on agricultural practices.
5. Conceptualise the nature and type of industries along with the trade balance among the South Asian countries.
6. Discuss the major environmental problems and cooperation of South Asia.
7. Visualise the aims, objectives and visions of SAARC as a region.

Course Learning Outcomes (CLOs)

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

1. Know the basic information regarding the member countries will be explored.
2. Find out the uniqueness of the region in terms of its physiography, climate and vegetation pattern.
3. Assess the cultural environment of South Asia, including ethnicity, population dynamics, economy, agriculture, industry and trade.
4. Know the environmental and water sharing problems of South Asia with its neighbouring countries.
5. Understand the importance of SAARC as a regional organisation of South Asia.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction: Defining the Geographical Location, Land and borders, Basic Information of Member Countries, History of South Asia as a Unique Geographical Region, Basic Demographic and Socio-economic profile	7.5	1
2	Natural Landscape of South Asia: The Natural Landscape, Climatic Division, Natural Vegetation, Soil	7.5	2

3	Cultural Environment of South Asia: Ethnic Mosaic, Population Growth, Composition, and Dynamics	7.5	3
4	Agriculture and Economy: Agricultural Systems, Major Crop Productions, Green Revolution and Food Security, Economy of South Asia	9	3
5	Industry and Trade: Large-Scale Industry, Medium and Small-Scale Industry, Industrial Policies	7.5	3
6	Major Problems and Co-operation of South Asia: Environmental Problems, Water Sharing of Major Rivers	1.5	4
7	SAARC: Origin, aims, visions, and importance	1.5	5

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Abbasi, B.A. (1991). *Geography of South Asia*. Sang-e-Meel Publication, Lahore.
- Dutt, A. K. and Margaret, M. G. (1987). *Atlas of South Asia*. Westview Press, London.
- Stewart, M. (2007). *South Asia*, Heinemann Library

Course Code	: GEATh 410
Course Name	: Fundamentals of Spatial Planning
Course Type	: Theory
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course provides a foundational understanding of spatial planning by integrating theoretical perspectives, practical approaches, and contextual applications. It explores how planning imagination, spatial thinking, and multi-scalar processes shape the organization of space from local to global levels. The course examines classical and contemporary planning theories, planning needs and desires, and the complexities inherent in planning systems. Emphasis is placed on land use planning, governance structures, and institutional frameworks, with particular attention to the context of Bangladesh. Through this course, students develop analytical and critical skills necessary to engage with real-world spatial planning challenges.

Course Objectives

1. Develop a conceptual understanding of spatial planning, its scope, and significance across different scales.
2. Introduce major theoretical approaches and evolving paradigms in spatial planning.
3. Enhance understanding of planning needs, social justice, and sustainability considerations.
4. Familiarize students with planning methods, tools, and project cycles.
5. Provide knowledge of land use planning, governance systems, and institutional frameworks.
6. Contextualize spatial planning practices and challenges in Bangladesh.

Course Learning Outcomes (CLOs)

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

1. Explain key concepts, scope, and scales of spatial planning and spatial thinking.
2. Analyze classical and contemporary planning theories and their practical relevance.
3. Evaluate planning needs, inequalities, and sustainability challenges in spatial contexts.
4. Apply planning methods and tools, including forecasting, participation, and project cycles.
5. Assess land use patterns, changes, and planning strategies, including risk-sensitive approaches.
6. Examine planning institutions, governance frameworks, and planning practices in Bangladesh.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Planning Imagination and Spatial Thinking: Definition, scopes and significance of spatial planning; Planning imagination (thinking across time and temporalities); Scales of planning (From Site to Ecumenopolis); Movement, networks, and flows in spatial systems	4.5	1
2	Theories and Approaches in Spatial Planning: Classical planning theories (rational, incremental, advocacy); Contemporary	6	2

	approaches (deliberative, collaborative/participatory, strategic and grassroots planning, co-production)		
3	Planning Needs and Desires: Planning for justice (inequality, equity, and spatial injustice); Contextualising needs (water, shelter, food, sanitation, infrastructure, etc.); Understanding desires (consumption behaviour, sustainability, environmental limits)	6	3
4	Planning Complexity and Challenges: Wickedness and unanticipated consequences of planning and planning failures; Externalities and the tragedy of the commons	4.5	3,4
5	Methods of Planning: Trends, forecasts, scenarios; Deliberations (participation, consultation, communication); Actions (participation and co-production); Planning project cycle	6	4
6	Land Use and Land Use Planning: Land use concepts and classification; Spatial patterns of land use; Land use change and its drivers; Land use planning; Risk-sensitive land use planning; Economics of land use planning	6	5
7	Planning Institutions and Governance: Planning institutions and frameworks; Policy, legislation, and regulatory tools; Decentralisation and local governance	4.5	6
8	Spatial Planning in Bangladesh: History, framework, institutions and challenges; Spatial Planning Bill 2026	4.5	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher.
- Syllabus for the In-course examination will be decided by the course teacher.

Reading Materials

- Phelps, N. A. (2021). *The urban planning imagination: A critical international introduction*. John Wiley & Sons.
- Tewdwr-Jones, M., Phelps, N., & Freestone, R. (Eds.). (2013). *The planning imagination: Peter Hall and the study of urban and regional planning*. Routledge.
- Hall, P. (2014). *Cities of tomorrow: An intellectual history of urban planning and design since 1880* (4th ed.). Wiley-Blackwell.
- Healey, P. (1997). *Collaborative planning: Shaping places in fragmented societies*. Macmillan.
- Allmendinger, P. (2017). *Planning theory* (3rd ed.). Palgrave Macmillan.
- Campbell, S., & Fainstein, S. S. (Eds.). (2012). *Readings in planning theory* (3rd ed.). Wiley-Blackwell.
- Crane, R., & Weber, R. (Eds.). (2015). *The Oxford handbook of urban planning*. Oxford University Press.
- UN-Habitat. (2009). *Planning sustainable cities: Global report on human settlements*. Earthscan.
- Ratcliffe, J., Stubbs, M., & Shepherd, M. (2009). *Urban planning and real estate development* (2nd ed.). Routledge.
- Adams, D., & Tiesdell, S. (2013). *Shaping places: Urban planning, design and development*. Routledge.
- Islam, N. (2005). *Dhaka now: Contemporary urban development*. Bangladesh Geographical Society.

Course Code	: GELb 411
Course Name	: Techniques in Physical Geography
Course Type	: Practical
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

Effective study in physical geography requires intensive investigation in the laboratory. This course offers the students to conduct laboratory based activities aiming to analyze data on various hydro-morpho-ecological regions following a systematic research methodology

Course Objectives

1. Aiming to develop the competency among the students to formulate comprehensive laboratory analysis for physical geographical investigation
2. Aiming to develop skills to operate and use various tools and techniques in the laboratory to analyze hydro-morpho-ecological data.
3. Aiming to develop the skill to data analysis and report writing.

Course Learning Outcomes (CLOs)

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

1. Develop adequate competency in laboratory methodologies.
2. Generate experimental data in the laboratory.
3. Analyse laboratory data and prepare scientific reports.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction , types, measurements, Qualitative & Quantitative Analysis, Applications	9	1
2	Study of Fluvial Process : Morphometric Analysis, Discharge and Flood Frequency Analysis; Analysis of Long Profile and Cross-section Geometry	6	1,2
3	Study of Meteorological Process : Rainfall and Temperature trend study	6	1,2
4	Study of Rocks and Minerals : Principles, Types, Identification, Properties	9	1,2
5	Study of Physical Properties of Soil : Colour, Soil Humidity, Bulk-density, Porosity and Voids ratio, Soil Texture, Grain Shape. Heavy Minerals, Mica	6	2,3
6	Particle Size Analysis : Sieve Method, Hydrometer Method, Pipette Method, with merits and demerits	6	2,3
7	Study of Macrofossil Fossil Woods; Fossil Animal	9	2,3
8	Study of Microfossils : Pollen Analysis; Diatom Analysis; Foraminifera Analysis	12	2,3

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher
- Syllabus for the In-course examination will be decided by the course teacher

Reading Materials

- Gouide, A. (1990). *Techniques in Physical Geography*. Routledge.
- Braiser, M. D. (1979). *Microfossil*. Chapman and Hall.

Course Code	: GELb 412
Course Name	: Environmental Analysis
Course Type	: Practical
Course credits and marks	: 2 Credits (50 marks)
Academic session	: 2024-2025

Course Introduction

This course introduces the techniques and methods of environmental analysis to the students of Geography and Environment. This course is designed to provide the basic understanding of environmental pollutants, their properties and also to familiarise with the available methods of assessing the quality of air, water and soil.

Course Objectives

1. To introduce the students to a basic knowledge of analytical techniques to environmental samples, including water, soil and air
2. To provide the students with an understanding of environmental pollution and pollutants
3. To provide students with hands-on training in environmental analysis techniques through practical laboratory exercises and case studies.

Course Learning Outcomes (CLOs)

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

1. Explain the fundamentals of environmental analysis, different types, measurements, errors and accuracy
2. Implement laboratory safety protocols, Quality Assurance (QA) standards, and prepare accurate standard solutions.
3. Execute appropriate field sampling and preparation techniques for water, soil, and air.
4. Use titrimetric, colorimetric, and spectroscopic methods to analyse physical and chemical water quality parameters.
5. Quantify soil chemical properties to assess environmental health and degradation.
6. Monitor air pollutants, including particulate matter and gaseous oxides, using standard analytical principles.
7. Evaluate laboratory findings against national and international environmental regulatory frameworks.
8. Produce professional technical reports that communicate scientific data with ethical integrity and clarity.

Course Contents

S L	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Introduction to Environmental Analysis: Definition of basic terms related to Environment and Environmental Analysis; Types of Environmental Analysis: Qualitative & Quantitative Analysis; Units of measurement; Errors in quantitative analysis; Precision and accuracy in measurement	3	1
2	Safety, Quality assurance and standards; Standard solutions Preparation of Standard Solutions	4.5	2
3	Environmental quality and indices: Quality of water, soil and air	3	7
4	Sampling and Sample preparation techniques for environmental analysis; Phase Extraction for analysis; Water, Soil, Air sampling	3	3
5	Water Analysis: Water pollution and Pollutants; Methods of water Quality assessment: Titrimetric, Colorimetric, and Spectroscopic procedures; <i>Practical Assessment of water</i> : pH, Conductivity, DO, BOD, COD, Hardness; <i>Analysis of common anions in environmental waters by wet methods</i> : Chloride, Nitrate, Phosphate, Carbonate and Bi-carbonate	15	4
6	<i>Soil Analysis</i> : Soil Pollution and Pollutants; Soil pH; Salinity and electrical conductivity; Organic matter content of soil	9	5
7	Air Analysis: Basic composition of Air and its pollutants; PM; Sulfur oxides; Nitrogen Oxides; Carbon dioxide, Ozone	4.5	6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Patnaik, P. (2017). *Handbook of environmental analysis: Chemical pollutants in air, water, soil, and solid wastes* (3rd ed.). CRC Press.
- Csuros, M. (1997). *Environmental sampling and analysis: Lab manual* (1st ed.). CRC Press.
- Hussain, C. M., & Keçili, R. (2020). *Modern environmental analysis techniques for pollutants*. Elsevier.
- Nigam, A., & Gupta, R. (2020). *Environmental analysis laboratory handbook*. John Wiley & Sons, Inc.
- Manahan, S. E. (2022). *Environmental chemistry* (11th ed.). CRC Press.
<https://doi.org/10.1201/9781003096238>

Course Code	: GELb 413
Course Name	: Landuse Survey
Course Type	: Practical (Fieldwork)
Course credits and marks	: 3 Credits (100 marks)
Academic session	: 2024-2025

Course Introduction

This course aims to develop a foundational understanding of landuse interpretation, environmental and socio-economic analysis. It further equips students with field techniques and methodological approaches for conducting rural and urban landuse surveys, environmental assessments, and socio-economic studies.

Course Objectives

1. Develop conceptual understanding of various aspects of landuse analysis.
2. Explain detailed landuse classifications for the assessment of landuse patterns and processes.
3. Examine the socio-economic conditions of populations within specific geographic regions;
4. Apply theoretical knowledge to assess environmental conditions and disaster risks through field-based investigations.

Course Learning Outcomes (CLOs)

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

1. Understand the fundamental concepts of landuse patterns in rural and urban areas of Bangladesh.
2. Become acquainted with the techniques of land use study and socio-economic analysis.
3. Develop a practical understanding of the spatial analysis of landuse change.
4. Demonstrate familiarity with various landuse models and compare them across urban structures at national, regional and international levels.
5. Apply acquired knowledge to hypothetical landuse scenarios to promote land conservation.

Course Contents

SL	Contents	Allocated time (Hrs)	Alignment with CLOs
1	Landuse Types and Patterns: Definition of Basic Terms related to Landuse, Types of Landuse, Landuse Change, Landuse Models, Settlement Types, Physical and Topographical Features, Types, Characteristics	6	1, 4
2	Fieldwork for Landuse Survey: Needs of Fieldwork for Landuse Survey, Site Selection, Field Plan, Fieldwork Preparation, Selection of Research Topic, Research Design and Methodology	12	2
3	Landuse Mapping: Base Map Preparation, Mouza Map Preparation, Identification of Present Condition of Landuse, Preparation of Landuse Maps, Map Interpretation and Analysis	12	2, 3
4	Landuse Survey: Questionnaire Preparation, Determine the Factors of Landuse Change	9	2, 3

5	Environmental Analysis: Cropping Pattern, Soil Texture, Soil Quality for Agricultural Production, Methods of Soil Texture Assessment	6	3
6	Socio-Economic Study: Socio-Economic Factors, Economic Pattern, Impact of Social and Economic Changes on Landuse and Ambient Environmental Conditions	12	2
7	Report Writing and Presentation: Data Analysis, Data Presentation, Preparation of Report Writing	6	2, 6

Teaching Strategies and Activities

- Lecture with multimedia, Interactive discussions, Group/Individual Assignment, Presentation, Field visit, Data collection, analysis and reporting.
- Presentation and assignment topic will be decided by the course teacher

Reading Materials

- Ansari, J. H., & Einsiedel, N. V. (1998). *Urban Land Management*. Oxford Publication.
- Cautley, R. W. (2023). *Description of Land: A Textbook for Survey Students*. Legare Street Press.
- Hudson, R., & Rhind, D. (1980). *Land Use*. Methuen and Co. Ltd.
- Stamp, D. (1969). *Land for Tomorrow: Our Developing World*. Indian University Press.
- UNDP. (2004). *GIS Atlas on Land Use and Environment*. DLRS, Ministry of Land, Government of Bangladesh.