



CURRICULUM

**Professional Masters in Disaster and Climate
Resilience (PMDCR)
For the Academic sessions
2023-2024 and 2024-2025**

Department of Disaster Science and Climate Resilience
Faculty of Earth and Environmental Sciences
University of Dhaka
Dhaka-1000
Bangladesh



Department of Disaster Science and Climate Resilience (DSCR)
Faculty of Earth and Environmental Sciences
University of Dhaka (DU)
Course Structure for Professional Masters in Disaster and Climate Resilience (PMDCR)
(Semester-System Course Structure)

1. Introduction to the Department:

On the first day of July 1921 the University of Dhaka opened its doors to students with Sir P.J. Hartog as the first Vice-Chancellor of the University. The University was set up in a picturesque part of the city known as Ramna on 600 acres of land. At present, the University consists of 13 Faculties, 83 Departments, 13 Institutes, 20 residential halls, 3 hostels, and 56 Research Centers.

Among them is the Department of Disaster Science and Climate Resilience, which was renamed in January, 2022 from Department of Disaster Science and Management that in turn started its journey in 2012. The evolution of the department's name is a reflection of the importance given to climate change studies, along with hazard science and disaster management. The aim is to integrate earth science, social science, and engineering in order to generate multidisciplinary and comprehensive knowledge and skills, to understand and address complex risk and emergency scenarios and eventually create a resilient society. The Department runs with the vision to provide international standard and high-quality education, engage in collaboration and has particular focus on basic and applied research.

2. Introduction to the Program:

Title of the Program: Professional Masters in Disaster and Climate Resilience (PMDCR)

Duration of the Program: 1 Year and 6 Months

Objective of this Program:

The objective of this program is to offer an add-on learning opportunity for the students to be prepared for the imminent disasters and adverse impacts of climate change by building a disaster resilient nation.

Disasters are no longer seen as the hazardous events created entirely by natural or man-made processes rather as manifestations of unresolved problems of development. Climate change further intensified the risk as the hazards become more frequency and severe. In the current paradigm shift from the response and recovery to the disaster risk management, attention has

been given to holistic approaches. The paradigm shift makes sure that the scientific and technological application and innovation are crucial for risk reduction, develop resilience and aware of sustainable development. The advancement of knowledge on scientific and social aspects to resilient crisis management has also evolved as an imperative for sustainable development.

Giving due attention on the paradigm shift, which directs disaster management and climate resilience to evolve as a Discipline, the curriculum of the Professional Master's degree has been designed.

Justification of this Program:

The Department of Disaster Science and Climate Resilience is well-equipped to run a Professional Masters course on Disaster and Climate Resilience due to its expertise in the field. The department comprises highly qualified and experienced faculty members who have practical knowledge in disaster risk reduction, climate change, and sustainable development. The department is equipped with advanced equipment, and a number of new equipment are going to be added in the repertoire. The cutting-edge laboratory facilities and state-of-the-art research opportunities are given at both undergraduate and graduate levels, which allows the students to be engaged in research activities. The well-designed, cutting-edge laboratory facilities that facilitate ground-breaking research activities in disaster and climate sciences and its management-related arenas include Disaster Impact & Humanitarian Need Assessment Lab, Geohazard Modeling Lab, Climate Change and Environmental Pollution Lab, Hydrological and Hydro-meteorological Hazard Lab, Geodesy and Geoinformatics (G&G) Lab. The department is in a unique position as a knowledge hub to not only generate knowledge but also effectively disseminate them along with other global research and successful practices at different stakeholder levels through symposiums, seminars, conferences, roundtables, training workshops, policy dialogues, policy briefs, awareness campaigns, etc. The department also plays an active role in executing national-level knowledge-driven projects while maintaining international standards through effective collaborations. Moreover, the course curriculum of the department is designed based on the latest trends and practices in the field of disaster and climate resilience, and students are provided with hands-on training and practical experience. With its strong academic foundation, research focus, and practical training opportunities, the Department of Disaster Science and Climate Resilience is well-suited to offer a Professional Masters course on Disaster and Climate Resilience.

Admission Session and Duration:

The two-year Professional Masters in Disaster and Climate Resilience (PMDCR) at the University of Dhaka is a program of three semesters. Each semester consists of six months. Students are required to take all courses equivalent to 40 credit hours in total. The degree will have to be achieved within a timeframe of a maximum of 5 years.

Course classes will be held on week holidays (Friday and Saturday) avoiding obstruction of the regular academic programs.

Every year new students will be admitted in not more than two sessions. These sessions will be the winter session (January-June) and the summer session (July-December)

Eligibility of Admission:

A student will minimum require a graduation degree from any recognized university for being eligible for admission. No candidate with a third division/class or GPA/ CGPA less than 2.5 at any stage of academic degree will be eligible to apply.

A written exam will be taken where the students have to obtain at least 40% to pass the examination. Based on the merit list, the students will be selected/admitted into the Professional Masters Programme.

The eligibility of candidates from foreign universities will be evaluated by the equivalence committee of the University of Dhaka in accordance with admission regulations.

For admission, professionals will be given priority. But they will require permission from their respective authorities for the completion of the admission procedure.

3. Structure of the Curriculum:

Students of the Master's Program will have to take a total of 40 credit hours-equivalent courses.

Credit and distribution of courses over the Semester

Theory:

- 28 Credit Hours for 2 credit courses
- 42 Credit Hours for 3 credit courses

The course and credit over three semesters are illustrated below:

Courses and Credits	First Semester	Second Semester	Third Semester	Total
Number of Course	5	6	4	15
Credit Distribution	13	14	13	40

In general state, classes will be conducted in departmental classrooms. A maximum of 30% of the classes could be held online based on the recommendation of the departmental academic committee. In the case of deterioration of the pandemic, the academic committee can recommend any new regulations based on the situation.

4. Assessment System:

4.1. Evaluation

Theory courses

Marks Distribution		
Formative		
Class Assessment	Class attendance	05%
	In-course and/or Assignment	30%
	Term Paper/Case Presentation/Quiz	15%
Summative		
Course Final Examination		50%
Total		100%

Thesis/Project Works

Marks Distribution	
Written Dissertation	60%
Final Defense	20%
Research Proposal	10%
Proposal Defense	10%
Total	100%

Class Attendance

Five percent of marks in theory courses and ten percent of marks in practical courses are added from class attendances.

Marks of attendances

Attendance %	Marks (Theory)
90 and above	05
85 to 89	04
80 to 84	03
75 to 79	02
60 to 74	01
Less than 60	00

In course and/or assignments

Fifty percent marks in theoretical course will be added from in-course tests and/or assignments. Assessment may be done by taking class-test and/or by giving assignments.

The Class Test(s) for in-course assessment will be usually taken after covering 40% of the course topics and the course teacher will announce the dates of in-course examinations (preferably) at the beginning of the course. Maximum duration of in-course test will be one class hour. The concerned course teacher will be responsible to assess the students of his/her course. In theoretical courses assignment will be selected from the course syllabus or from topics related to course syllabus. The assignment may consist of written report or presentation or both.

4.2 Course Final Examination

For appearing in the semester final examination, every student is required to have authorized examination admit card supplied by the Controller of Examination on payment of dues (for each semester).

Eligibility of Setting for the Final Exam

- Student having 75% or more attendance on average (collegiate) are eligible to appear in the final examination.
- Student having 60-74% attendance is considered to be non-collegiate and will be eligible to sit for the final examination on payment on fine tk. 5,000/= (five thousand).
- Student having attendance less than 60% will not be allowed to sit for the final examination but may seek readmission in the program.

Duration of Exam

The duration of theoretical course final examinations will be as follows:

Credit	Duration of Examination
---------------	--------------------------------

2 credit courses	2.5 hours
3 credit courses	3 hours

Evaluation of Examination Script

In Final Examination, each theory course will be evaluated by the course teacher (single examiner) of the department or outside (who may be either from DU or outside DU). In a course taught by two teachers, the semester final test scripts must be evaluated by only one teacher, one of whom must be the course teacher, and had taken the maximum class.

4.3: Grading Scale and Grades

At the time of evaluation all marks will be entered in numerical form. Only at the time of submitting the final grade sheet and while finalizing the results in the tabulation sheet, grades will be entered in both numerical and letter grade form.

Marks can be given in fraction up to two decimals. If the total marks of a course are in fraction. They should be raised to the higher whole number.

GPA and CGPA can be in fraction up to two decimals. The second decimal will be raised to the next higher number if the third decimal number is 5 or above.

Transcript issued to the students will include Letter Grades, Grade Point (GP), Grade Points Average (GPA), and Cumulative Grade Point Average (CGPA). Transcript will not include numerical grades.

Numerical Grades, Letter Grades, and Grade Point Averages (GPA), and Cumulative Grade Point Average (CGPA) will be given according to the following scale:

Numerical Marks	Letter Grades	Grade Points
80 above	A+	4.00
75 -79	A	3.75
70 – 74	A-	3.5
65 -69	B+	3.25
60 – 64	B	3.00
55 -59	B-	2.75
50 – 54	C+	2.50
45 -49	C	2.25
40 – 44	D	2.00
Less than 40	F	0.00
Incomplete (did not take an exam)	I	0.00
Withdrawn (did not attend any class and take any exam)	W	0.00

Calculation of GPA and CGPA

GPA (Grade Points Average) will be calculated by multiplying the course credits by the GP (Grade Points) obtained in the courses and dividing the total-by-total credits. CGPA of more than one semester will be calculated by adding the GPA of the semesters concerned multiplied by the semester credits and dividing the results by the total credits of the semesters.

$$\text{GPA of One Semester} = \frac{\text{Credits of Course A} \times \text{GP obtain in Course A} + \dots + \text{Credits of Course Z} \times \text{GP obtain in Course Z}}{\text{Total Credits of Courses of the semester}}$$

$$\text{CGPA of Year One} = \frac{\text{Total GP of 1st Semester} + \text{Total GP of 2nd Semester}}{\text{Total Credits of 1st and 2nd semester}}$$

$$\text{CGPA of four Semesters} = \frac{\text{Total GP of 1st Semester} + \dots + \text{Total GP of 4th Semester}}{\text{Total Credits (45)}}$$

4.4: Promotion

For the MS professional degree, each student is required to:

- i) Complete 40 credit hours without an F grade in any course
- ii) Earn a minimum CGPA of 2.50 and
- iii) Complete the program in maximum five consecutive academic years including the year of first admission into the program.

For appearing at each semester final examination, every student has to fill in examination entry form supplied by the authority on payment of dues.

The minimum CGPA of a student, as mentioned above, is calculated taking into consideration the grade points obtained in all courses.

Credit Transfer

No credit transfer from any other programs or institutions is allowed for the MS professional degree.

Improvement of Grades

As per university rules.

Re-admission

As per university rules.

4.5 Research Conduction and Supervisor Selection

In order to develop skilled personnel in problem identification, work-methodologies, scientific interpretation, producing a standard report; individual students shall carry out a supervised study independently on a specified topic. A topic will be selected by each student with the guidance from their supervisor/co-supervisor which is to be approved by the Academic Committee of the department. Students shall maintain contact with faculty of their field of interest for the selection of supervisor and/or co-supervisor. The Academic Committee shall approve the final list of supervisors. On completion of the Research, each student shall defend and submit written Report/Thesis on the work undertaken.

Evaluation of Research

The written dissertation will be evaluated by two assigned Experts (assigned by the academic committee). For the presentation Exam Committee will evaluate each student's presentation. Other faculty members/supervisors can be present during the presentation. Proposal Marks distribution has been shown above.

Plagiarism and Referencing

Plagiarism is use of intellectual material without acknowledging its source. Common examples are copying, paraphrasing (from published, unpublished or web-based sources) without acknowledging/referencing the authors.

Plagiarism is a serious academic offence and violation of academic and student conduct rules. It is regarded as theft of intellectual property. **It is punishable with falling grades or possibly more severe action.**

Referencing is the process of acknowledgement of the sources (words and ideas of another author) used in essay, assignment, dissertation or anything else.

Academic Program and Course Management Policy

This professional program will be operated by a 3-member course management committee formed by the department's academic committee. The maximum tenure of this 3-member committee will be two years. The department's chairman will automatically be a member of this committee during his/her service.

The 3-member course management committee comprises the following members:

Coordinator: 1 Person

Member: 1 Person

Member – Chairman: 1 person

This committee will conform to the rules and regulations of the professional program. They will update the departmental academic committee on the overall progress at the beginning and end of each semester.

The course management committee will be able to hold a maximum of 4 meetings per semester. The university-approved course management committee members will get an honorarium for being present at each meeting.

Appointment of Teachers/Resource Persons

- In the PMDCR program, a minimum of 70% of the resource persons will be Dhaka University teachers.
- The external resource person's recruitment will be based on the approval of the departmental academic committee. For approval, the course management committee members will present the list of external resource persons to the academic committee prioritizing their academic records and experience.
- The internal course teachers will be selected and approved by the departmental academic committee based on their experience and expertise in the subject matter.

- All teachers will be recruited for a single semester. Based on the satisfactory feedback of the students, he/she might be recommended again for taking the same course in the following session.
- The departmental teachers who will not be involved as course teachers will be assigned to other tasks in this program.

Tuition and other Fees

Sl.	Description of Fees	Amount (BDT)			
		Semester-1	Semester-2	Semester-3	Total Amount
1	Registration Fee	2,500.00			2,500.00
2	Course Admission Fee	8,000.00			8,000.00
3	Semester Fee	1,000.00	1,000.00	1,000.00	3,000.00
4	Library Fee	500.00	500.00	500.00	1500.00
5	Security Deposit (Refundable)	5,000.00			5,000.00
6	Course Tuition Fee (5500.00/Credit)	71,500.00	77,000.00	71,500.00	220,000.00
	Total Payable	88,500.00	78,500.00	73,000.00	240,000.00
	Refundable				5,000.00
	Total Cost				235,000.00

** Exam fees will be applicable for the final exams.

** Transcript and Certificate related fees of the university will be applicable (same fee as the standard fee payable by a regular student of Dhaka University.)

Additional Fees/Payments (If required):

Sl.	Subject	Amount (Tk.)
1	Re-Admission	5,000.00
2	Non-Collegiate (Per Subject)	5,000.00
3	Supplementary Examination Fee (Per Subject)	5,000.00
4	Course Registration Fee	500.00

** The Academic Committee of the department may modify/impose additional fees for using different facilities of the department (if applicable).

*Disclaimer: The university authority reserves the right to modify/change the tuition fee as per requirement. Students/University has to pay their own cost during field study if needed.

Review of Fee Structure

All fees mentioned in the above table will be reviewed as and when necessary, by the university authority and the students will be liable to pay the fees as per changed/reviewed fees.

Deadline for Submission of Fees/Dues

The admitted students will have to clear all the fees during the admission process after publication of result. For subsequent semesters, the payment of all fees/dues must be maintained semester wise and the following rules will apply in this regard:

- The semester fees can be paid within 15 days after commencement of each semester without any penalty.

- The students may pay their fees after 1st 15 days within one-month time by paying a penalty of Tk. 500.00 for each 15 days.
- If a student fails to pay the semester fees within one and a half month, his/her name will be dropped and the student will have to apply for re-admission, should he/she desire to continue his/her study. If approved, he/she may take re-admission paying required re-admission fee.

Course Structure: Professional Masters in Disaster and Climate Resilience

1st Semester:

Course ID	Course Title	Credit
DPMT 5001	Introduction to Disaster Management	2
DPMT 5002	Fundamentals of Climate and Climate Change	2
DPMT 5003	Fundamentals of Earth Sciences	3
DPMT 5004	Geological and Hydro-meteorological Hazard	3
DPMT 5005	Anthropogenic Hazard	3
Total Credit		13

2nd Semester:

Course ID	Course Title	Credit
DPMT 5006	Hazard, Vulnerability, and Risk Assessment	3
DPMT 5007	Risk Sensitive Land Use Planning	2
DPMT 5008	Gender Equality and Social Inclusion in DRM	2
DPMT 5009	Geographic Information System (GIS) and Remote Sensing	3
DPMT 5010	Legal and Institutional Arrangement for DRM	2
DPMT 5011	Humanitarian Emergency and Crisis Management	2
Total Credit		14

3rd Semester:

Course ID	Course Title	Credit
DPMT 5012	Project Management and Monitoring	2
DPMT 5013	Damage and Loss Assessment: Disaster and Climatic Context	2
DPMT 5014	Climate Change Adaptation and Climate Financing	3
DPMT 5015	Research Methodology and Thesis	6
Total Credit		13

Detailed Contents of the Courses

Course Number and Title: DPMT 5001 Introduction to Disaster Management

Credit: 02

Introduction to the Course:

Disasters are no longer considered isolated events but are now addressed as complex phenomena with multidisciplinary dimensions. Over the years, the frequency and intensity of disasters have increased multifold. With the growing population, more and more infrastructures are being developed; creating more elements at risk and, sometimes, new risks. To manage the risks and consequences of disasters, it is essential to understand the concepts of disaster management. This course offers the concept and framework of modern scientific approach for studying disasters, their key components and terminologies.

Specific Objectives:

The specific objective of teaching this course is to provide students with a comprehensive understanding of the concepts, terminologies, and approaches used in disaster management, risk assessment, and capacity building. By the end of the course, students should be able to identify and analyze potential hazards and vulnerabilities, evaluate risks, and develop effective strategies to manage disasters and build resilience in the face of future challenges.

Course Contents:

Topics

- Topic 1:** Disaster: Definitions of Terminology; Sciences of Disaster; Meaning and Impact; a Four Phase Approach of Disaster Management; Disaster Trends.
- Topic 2:** Hazards: Hazard Characteristics, Hazard Classification, Natural Hazards (Meteorological, Hydrological hazards, Hydro-meteorological hazards, Climatic Hazards, Geological hazards and Biological hazards), Technological and Man-made hazards); Hazard Identification and Hazard profiling.
- Topic 3:** Risk: Component of Risk (Likelihood, Consequence and Trends); Risk Evaluation; Risk Acceptability and Alternatives
- Topic 4:** Vulnerability: Physical Profile; Social Profile; Environmental Profile; Economic Profile; risk factors influencing vulnerability; Risk Perceptions.
- Topic 5:** Capacity: Definition, Relation with other disaster terminologies.
- Topic 6:** Fundamental Approach of Disaster Management in Bangladesh: History of Disaster Management, Paradigm shift; Disaster Management framework and Institutions.

Learning Outcomes

By the end of the course students will be able to learn:

- Define disaster terminology and understand its impact
- Describe the sciences of disaster and the four-phase approach of disaster management
- Identify and classify hazards, including natural, technological, and man-made hazards
- Understand hazard characteristics and profiling
- Understand risk components and evaluation
- Analyze risk acceptability and alternatives
- Analyze physical, social, environmental, and economic profiles of vulnerability

- Understand the risk factors influencing vulnerability and risk perceptions
- Define capacity and its relation to other disaster terminologies
- Understand the history of disaster management and paradigm shift
- Analyze disaster management framework and institutions.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. Experiential learning techniques like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem-solving and hands on learning are encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Comprehensive Disaster Management Program (CDMP) (2009) Disaster Dictionary. Dhaka, Bangladesh.
2. Coppola D.P. (2007) Introduction to International Disaster Management. Elsevier. UK.
3. Cees Westen et al (2011) Multi-hazard Risk Assessment. Public Works
4. Paul B.K. (2011) Environmental Hazards and Disasters: Contexts, Perspectives and Management. Wiley-Blackwell. US.
5. Pinkowski J. (2008) Disaster Management Handbook. CRC Press. US.
6. Smith K. & Petley D.N. (2009) Environmental Hazards: Assessing Risk and Reducing Disaster. Routledge. New York.
7. United Nations Office for Disaster Risk Reduction (UNDRR) (2020) Sendai Framework Terminology on Disaster Risk Reduction
8. Westen et al (2011) Multi-hazard Risk Assessment Guidebook
9. Wisner B. (2004) At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge. US.

Course Number and Title: DPMT 5002 Fundamentals of Climate and Climate Change

Credit: 02

Introduction to the Course:

In the course “Fundamentals of Climate and Climate Change” students get the basic ideas about atmospheric processes that determine weather and climate. In this course student will use their knowledge from “Fundamentals of Climate and Climate Change” to learn the causes, description, distribution of different climatic/hazards elaborately. Student will also learn climate change: causes, evidences, impact, response as well as global political issues regarding climate change.

Specific Objectives: To learn atmospheric extremes and climate change issues.

Course Contents:

Topics

- Topic 1:** Basics Of Climate Science: Basic Concepts of Climatology and Meteorology, Earth and Its Atmosphere.

- Topic 2:** Climatic and Meteorological Hazards: Extreme Temperature, Drought, Fog, Polar Vortex, Wildfire (Forest Fire and Land Fire), Tropical Cyclone, Extra-Tropical Cyclone, Local Severe Storms: Thunderstorms, Nor'westers, Tornadoes, etc.
- Topic 3:** Introduction to Climate Change: Definition, Scope, Multidisciplinary Approaches
- Topic 4:** Science of Climate Change: Milankovitch Cycle, Natural and Anthropogenic Factors, Greenhouse Gases (GHG) And Greenhouse Effects
- Topic 5:** Evidence of Climate Change: Past (Proxy Data), Present (Human Perception, Marker Species, Instrumental Data), Future (Climate Modeling), Future Temperature and Rainfall Anomalies in Bangladesh
- Topic 6:** Global Atmospheric and Oceanic Circulation: General Circulation Model, El-Nino, La-Nina and Climate Change
- Topic 7:** Impact Of Climate Change: Trends of Global Climate Change (IPCC AR6), Projected Global GHG Emissions, Sector Issues in Regional and International Context (Agriculture, Energy Budget, Society and Culture, Indigenous People, Disease, Extreme Events and Climatic Hazards, Sea-Level Change, Climatic Induced International Migration, etc.)
- Topic 8:** Types of Climate Models: Energy Balance Climate Model, One-Dimensional Radiative-Convective Climate Model etc.,
- Topic 9:** Climatic and Meteorological Data Source (National and International).
- Topic 10:** Climate Change Adaptation, IPCC, COP, Negotiation, Building Blocks in Climate Change Negotiation Process, Emerging Approaches, Nationally Determined Contributions (Involvement of Ministries and Agencies, Actions, Challenges, Opportunities), National Adaptation Programme of Action (NAPA)

Learning Outcomes:

- What are the atmospheric extremes
- Causes, structure, distribution of the atmospheric extremes
- Causes, evidences, impact, response as well as global political issues regarding climate change.
- Causes, structure, distribution of the atmospheric extremes and climate change issues of Bangladesh
- Basics of Climate Modeling

Instructional Strategies:

Visual aids like Multimedia will be used to present lectures. All the materials will be provided in soft copies or hard copies. Soft copies will be provided through common group email account. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation.

Students are expected to be enthusiastically involved in the classroom activities. In addition, problem solving, and on-line discussions will be highly appreciated.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Allaby M. (2007) Encyclopedia of Weather and Climate. Vol I and II. Facts on File Inc. US.
2. Barry R. G. and Chorley R.J. (1987) Atmosphere, Weather and Climate. Methuen. UK.
3. Byers H.B. (1974) General Meteorology. 4th Edition. McGraw-Hill Co. US.
4. Hartman D.L. (1994) Global Physical Climatology. International Geophysics Series. Volume 56. PP. 412. Academic Press. US.
5. Hidore J.J. and Oliver J.E. (2009) Climatology: An Atmospheric Science. 3rd Edition. Prentice Hall. US.
6. Barrie Pittock (2009) Climate Change: the science, impacts and solutions, CSIRO Publishing.
7. Cook, K.H. (2013) Climate Dynamics. Princeton University Press.
8. Donner L., Schubert W. and Somerville R. 2011. The Development of Atmospheric General Circulation Models: Complexity, Synthesis and Computation. Cambridge University Press. UK.
9. Farmer G.T. and Cook J. (2013). Climate Change Science: A Modern Synthesis. Springer. Netherlands.
10. Hyndman D. and Hyndman D. (2010). Natural Hazards and Disasters. 3rd Edition. Cengage Learning. India.
11. Knight C.G. and Jäger J. 2009. Integrated Regional Assessment of Global Climate Change. Cambridge University Press. UK.
12. Pittock A. 2009. Climate Change: The Science, Impacts and Solution. 2nd Edition. Routledge. US.
13. Savindra Singh (2005). Climatology. Prayag Pustak Bhawan, Allahabad, India
14. William James Burroughs (2007) Climate Change-A Multi-disciplinary Approach, Cambridge University Press
15. Neelin J.D., 2011. Climate Change and Climate Modeling, Cambridge University Press, London
16. Dr. Philip J. Rasch, Philip J. Rasch, 2012. Climate Change Modeling Methodology: Selected Entries from the Encyclopedia of Sustainability Science and Technology, Springer-Verlag New York

Course Number and Title: DPMT 5003 Fundamentals of Earth Sciences

Credit: 03

Introduction to the Course:

To understand the risks of natural disasters, it is essential to understand the earth materials and the processes governing the planet. The earth and its components can act as a source of hazards as well as the elements at risk. The course incorporates different earth related disciplines, e.g. geology, geography, stratigraphy, hydrology, environment etc.

Earth materials and the processes interact among themselves to configure the shape of the earth's surface. However, this system is dynamic and the changes often lead to catastrophes or disasters. Different agents drive different processes, and result in diverse configurations and various associated deposits. Each geomorphic feature is associated with different hazards. Also, earth's crust can be subdivided into plates which are in motion and, hence, either colliding or moving away from each other. This motion also causes disasters like earthquake, tsunami, volcanism, landslide etc.

Specific Objectives:

The course aims at studying the earth system as well as earth materials and processes which govern the natural disasters. Also, the course allows the earth materials to be studied from both hazard sources as well as elements exposed to hazards. The structural geology, stratigraphy, petrology, surficial processes, pedology etc. are integrated in this course to ensure a clear understanding of those above mentioned scenarios. The course also includes important components of geography that are essential for characterization of different components of disasters.

The course also aims at explaining the morphology of the earth and the agents that control them through certain natural processes. This course explains the major geomorphic units and their associated hazards. The course also comprises global tectonics and isostasy and how these triggers or amplify disasters. Moreover, the course also aims at understanding the processes, which have formed this configuration based on the evidence and try to predict possible hazards that may occur. Lastly, the course also incorporates the subdivisions of geomorphological units, tectonic units, geological units and the soils types of Bangladesh.

Course Contents:

Topics

- Topic 1:** Earth System: Origin of the earth and the solar system; interior of the earth; earth materials: rocks and minerals (their types, texture, structure and composition).
- Topic 2:** Fundamental of Geological Sciences: Terminologies of geology, geological time scale and mass extinction; geological structures (Folds, Faults, Discontinuities), scope of Geological science for Disaster Management studies.
- Topic 3:** Fundamental of Geography: Basic concepts in geography (Themes in Geography, World Physical and Human Region), Scope of Geography for Disaster Management Studies.
- Topic 4:** Earth's Surface Processes: Weathering process.
- Topic 5:** Soil Formation: Soil forming factor and process; Soil Profile characteristics: Physical, Chemical and Biological Properties of the soil.
- Topic 6:** Stratigraphic Concepts: Basic concepts of stratigraphy, Vertical and Lateral Successions, Stratigraphic Categories and Classification.
- Topic 7:** Geomorphology: Basic concepts of Geomorphology, natural agents (glaciers, running water and wind), their origin; earth surface processes- Fluvial,

Glacial, Aeolian and Coastal processes and their morphology. Major geomorphic features of the earth

Topic 8: Global Tectonic: Continental drift, seafloor spreading, plate tectonics, Isostasy

Topic 9: Drainage pattern and stream types and their relation to tectonics as well as lithology.

Topic 10: Hydrology: Hydrologic cycle, surface water; groundwater, aquifer, contamination of water

Topic 11: Geomorphic, stratigraphic units of Bangladesh; tectonic framework of Bangladesh; water resource of Bangladesh

Learning Outcomes:

By the end of the course students will be able to learn:

- The earth system, earth materials and the earth processes
- The fundamentals of geology, geological time scale, plate tectonics
- The ability to identify lithology, and structures which are essential to describe different natural hazards
- The processes that act in earth 's surface
- The concept of geology, geography, soil science, and their sub disciplines; their scope in disaster science and management
- The formation of rocks and their characteristics
- The geomorphic processes and agents
- Different landforms that are controlled by major structural units
- Drainage pattern, Stream types and their relation to the lithology
- Plate tectonics and associated hazards
- The classification of different units of Bangladesh, i.e. geological, tectonic etc.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands-on learning is encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Turbuck E.J., Lutgens F. K. and Tasa D.S. (2013) An Introduction to Physical Geology. 13th Edition. Prentice Hall. US.
2. Plummer C., Carlson D. & Hammersley L. 2014. Physical Geology. 15th Edition. McGraw
3. Hill. US.
4. Berry L.G. and Mason B. (1968) Elements of Mineralogy. Greenwood Press. US.
5. Boggs S. (2012) Principles of Sedimentology and Stratigraphy. Prentice Hall. US.

6. Billings M.P. (1972) Structural Geology. 3rd Edition. Prentice Hall. US.
7. Bradshaw M.J. et al. (1978). The Earth's Changing Surface. Wiley-Blackwell. US.
8. Brady N.C. & Weil R.C. 2008. The Nature of Properties of Soils. 14th Edition. Pearson. US.
9. Pettijohn F.J. (1975) Sedimentary Rocks. Harper & Row. US.
10. Robinson H. (1976) Human Geography. M & E Handbooks. Plymouth. US.
11. Tyrrell G.W. (1952) The Principles of Petrology: An Introduction to the Science of Rocks. Dutton & Company Inc. New York.
12. Hugget R.J. (2007) Fundamentals of Geomorphology. Routledge Publication
13. Imam B. (2005) Energy Resources of Bangladesh. University Grants Commission. Dhaka. Bangladesh.
14. Khan F.L. (1991) Geology of Bangladesh. The University Press Limited. Dhaka, Bangladesh.
15. Philip Kearey et al (2009) Global Tectonics, Wiley-Blackwell Publication

Course Number and Title: DPMT 5004 Geological and Hydro-meteorological Hazards

Credit: 02

Introduction to the Course:

Among the different types of disaster, the geological and hydro-meteorological hazards are the most commonly occurring as well as most devastating in terms of damage and loss. Climate change has further deteriorated the situation causing an increase in the amplitude for the hazards. The course has been designed to better understand the basic characteristics of these hazards; frequency, magnitude and intensity variability, types, spatial and temporal distribution, impacts etc. After the completion of the course, the student will be able to identify; characterize and analyze these hazards. The assessment of hazard is an essential component for risk assessment, and consequent sustainable disaster risk reduction measures. Hence, the course addresses different aspects of the earthquake, landslide, subsidence, flood, tsunami, erosion etc. Due to the geographic location, tectonic settings the above-mentioned hazards pose a serious threat; this course briefly incorporates the present status of these hazards in different parts of Bangladesh.

Specific Objectives:

A student is expected to learn the basics of specific geological and hydrometeorological hazard, hazard characterization and profiling, process, procedures and assumptions used for hazard analysis. Understanding, analyzing, evaluating and creating connections between the hazards in terms of magnitude, intensity and frequency shall allow a student to better understand the disaster risk framework.

Course Contents:

Topics

Topic 1: Introduction to Geological and Hydro-meteorological Hazards.

Topic 2: Hydro-Meteorological Hazards: origin, life cycle, types, effects and measurement and relation to global water cycle.

- Topic 3:** Earthquakes: concept, causes, characteristics, relation to geology, types and effects of Earthquakes
- Topic 4:** Tsunami: concept, tsunami generation, characteristics, Seiches, coastal effects.
- Topic 5:** Landslide, Avalanche: causes, mechanism, classification, measurement and effects Land subsidence and sinkholes. Mountain Hazards.
- Topic 6:** Flood: definition, hazard characteristics, causes, types, mitigation measures (structural and non-structural), Flood Action Plan (FAP).
- Topic 7:** Riverbank erosion: causes and effects, mechanism, types and relation to lithology, mitigation measures, early warning.
- Topic 8:** Cyclone, storm surge and coastal erosion: Basics of cyclones, mechanism, nomenclature, beach erosion and replenishment, storm surge characteristics
- Topic 9:** Salinity intrusion: cause, mechanism, mitigation measures
- Topic 10:** Arsenic contamination: concept, mechanism, mitigation measures
- Topic 11:** Drought: concept, mechanism, mitigation measures
- Topic 12:** Geological and Hydro-meteorological Hazards in Bangladesh

Learning Outcomes

By the end of the course students will be able to:

- Understand basics of specific geological and hydrometeorological hazard,
- Types, mechanism, temporal and spatial variability of these hazards, hazard characterization and profiling, process, procedures and assumptions used for hazard analysis.
- Understanding, analyzing, evaluating and creating connects between the hazards in terms of magnitude, intensity and frequency in order to better understand the disaster risk framework.
- Correlation between hazards and tectonics, petrology and other branches of earth sciences.
- Present context of the hazards in Bangladesh

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands-on learning is encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Hyndman D. and Hyndman D. 2010. Natural Hazards and Disasters. 3rd Edition. Cengage Learning. India.
2. Bell F.G. (1999) Geological Hazards. CRC Press. US.
3. Bird E. (2008) Coastal Geomorphology. 2nd Edition. Wiley-Blackwell. US.
4. Kusky T.M. (2005) Encyclopedia of Earth Sciences. Infobase Publishing. New York. US.
5. Lutgens F.K. and Tarbuck E.J. (2013) Earth: An Introduction to Physical Geology. 11th Edition. Pearson. USA.
6. Plummer C., Carlson D. and Hammersley L. (2014) Physical Geology. 15th Edition. McGraw Hill. US.

Course Number and Title: DPMT 5005 Anthropogenic Hazards

Credit: 03

Introduction to the Course: Human-induced hazards are growing in recent industrialized and urban settlements, especially in Bangladesh. This course mainly deals with hazards in the industry due to natural and human activity.

Specific Objectives: This course will expand students' knowledge of human-induced, engineering failure, and natural hazards.

Course Contents:

Topics

Topic 1: Human-Induced Hazards: Concept & Characteristics.

Topic 2: Engineering Failure: Cause, Effect, Case Studies

Topic 3: Fire Hazard: Concept and Terminologies, Fire Triangle, Classification, Control Measures, Detection, Extinguisher Types, Fire Precaution.

Topic 4: Risk from Reactive And Toxic Chemicals.

Topic 5: Nuclear Hazard: Concept, Sources , Mitigation and Control Measures, Case Studies.

Topic 6: Mining Hazard :Types and Effect.

Topic 7: Humanitarian Crisis Case Studies

Topic 8: Transportation Accident: Types and Effects.

Topic 9: Environmental Pollution, Hazardous Wastes, 3R

Topic 10: Industrial Hazards, Work Place Health and Safety

Topic 11: Cyberattack/ Cyberterrorism

Topic 12: Case Studies: Beirut Explosion (2020), Bhopal Gas Tragedy (1985), Chernobyl Tragedy, Fukushima Meltdown, Rana Plaza Tragedy, Nimtoli Tragedy, Syria Chemical Weapons Etc.

Topic 13: Manmade Hazards: Bangladesh Context.

Learning Outcomes:

By the end of the course students will be able to:

- Differentiate between natural hazards and manmade hazards.
- Explain engineering and mechanical reasons behind the engineering failure, chemical explosion, nuclear hazards, mine hazards etc.
- Explain reasons behind civil unrest and its consequences
- Fire safety and possible risk associated with it
- Assess industrial safety and potential risk, terrorist activity and their causes including geo politics, socio economic, cultural influences.

Instructional Strategies:

Visual aids like Multimedia will be used to present lectures. All the materials will be provided in soft copies or hard copies. Soft copies will be provided through common group email account. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. Students are expected to be enthusiastically involved in the classroom activities. In addition, problem solving and on-line discussions will be highly appreciated.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Carson P. and Mumford C. (1994) Hazardous Chemicals Handbook. Butterworth-Heinemann. Oxford. UK.
2. Davamani V. (2012) Technologies for Sustainable Green Environment. NIPA. India.
3. Dickenson et al (1999) Fire Service Emergency Care, Prentice Hall
4. Kevin Cassedy (1953) Fire Safety and Loss prevention, BH Publication
5. Jeremy Stranks (2012) Health and Safety at Work, Kogan Page
6. Macaulay T. (2008) Critical Infrastructure: Understanding its Component Parts, Vulnerabilities, Operating Risks, and Interdependencies. CRC Press. US.
7. Paul B.K. (2011) Environmental Hazards and Disasters. Wiley-Blackwell. US.
8. Schlager N. (1995) Breakdown: Deadly Technological Disasters. McGraw-Hill. US.
9. Shah V. (2009) Emerging Environmental Technologies. Springer. Netherlands.
10. King, R. W., and Magid, J. (2013). Industrial Hazard and Safety Handbook: (Revised Impression). Elsevier.

Course Number and Title: DPMT 5006 Hazard, Vulnerability and Risk Assessment

Credit: 03

Introduction to the Course:

Vulnerability is the degree of loss to a given element at risk (or set of elements) resulting from a given hazard at a given severity level. The distinction between this definition and that of risk is important to note. Risk combines the expected losses from all levels of hazard severity, taking account also of their occurrence probability. The 'intangible' aspects of vulnerability will often be as important as the quantifiable aspects. The vulnerability and risk assessment are considered the one of the most important, if not the most important core of disaster management framework. Disaster management has seen a shift in paradigm from being crisis management focused to risk management focused. Risk assessment portion of the risk management framework consists of Risk analysis and Risk evaluation. Risk analysis generally contains the

following steps: hazard identification, hazard assessment, elements at risk/exposure analysis, vulnerability assessment and risk estimation. The course has been preceded by hazard assessments and will be succeeded by sector wise Risk treatment/control to identify hazard-type wise risk reduction measures for conceptualization of the sustainable risk management framework.

Specific Objectives:

This course, Hazard, Vulnerability and Risk Assessment tends to:

1. Provide students with critical perspectives to understand the disaster management framework
2. Help the students develop a clear understanding of different components of vulnerability- both tangible and intangible and ability to conduct hazard assessment, exposure analysis; vulnerability assessment; risk estimation and, consequently, risk assessment for a specific hazard
3. Aid the students to develop multi hazard risk assessment for a specific area/ region

Course Contents:

Topics

Topic 1: Scope of hazard, vulnerability and risk assessment

Topic 2: Hazard identification tools, hazard assessment, natural and technological hazard assessment

Topic 3: Vulnerability assessment, components and characteristics of vulnerability, conceptual frameworks of vulnerability, vulnerability assessment methods.

Topic 4: Elements at risk, types of elements at risk, exposure analysis

Topic 5: Risk evaluation, risk perception, risk transfer

Topic 6: Uncertainty: aleatory and epistemic uncertainty

Topic 7: The purpose of risk assessment, qualitative and quantitative approach of risk assessment/risk estimation

Topic 8: Risk modeling: concept and steps, risk modeling tools (e.g. HAZUS, CAPRA, OpenQuake)

Topic 9: Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Hazard Impact Assessment (HIA), Disaster Impact Assessment (DIA) Framework and Methodology

Topic 10: Hazard specific vulnerability risk assessment procedures; multi-hazard risk assessment

Learning Outcomes:

By the end of the module students will be able to:

- Conceptualize, analyze and evaluate disaster risk management framework
- Conduct hazard, exposure and vulnerability assessment
- Identify both tangible and intangible vulnerabilities
- Calculate risk estimation and, consequently, risk analysis for specific hazard for a specific area/ region
- Conduct multi hazard risk assessment for a specific region
- Explore and critically evaluate risk, in order to identify the ‘best practice’ in terms of disaster risk reduction measures.

Instructional Strategies:

Visual aids like Multimedia will be used alongside whiteboard writing to present lectures. All the course materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning

like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands on field learning is encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Birkmann J. (2013) Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies. United Nations University Press. Japan.
2. Macaulay T. (2008) Critical Infrastructure: Understanding its Component Parts, Vulnerabilities, Operating Risks, and Interdependencies. CRC Press. US.
3. Ostrom L.T. Wilhelmsen C.A. (2012) Risk Assessment: Tools, Techniques and Their Application. Wiley-Blackwell. US.
4. Schneider S.K. (2011) Dealing with Disaster: Public Management in Crisis Situations. 2nd Edition. M.E. Sharpe. US.
5. Schumann A.H. (2011) Flood Risk assessment and Management. Springer. Netherlands.
6. Wisner B. (2004) At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge. US.
7. Westen et al (2011), A Guidebook of Multi-hazard Risk Assessment, Public Works

Course Number and Title: DPMT 5007 Risk Sensitive Land Use Planning

Credit: 02

Introduction to the Course: This course will introduce the basic concept of land use planning issues to the student in the context of disaster risk mitigation. Students will also learn current issues of urban and regional planning and development.

Specific Objectives: To learn the basic concept of land use planning and risk mitigation concept in the urban area.

Course Contents:

Topics

- Topic 1:** Definition, objective and scope of land use planning. Urban functions, activities and land use components. Modern planning principles.
- Topic 2:** Distinction between urban and rural areas. The concept, nature and scope of integrated rural development. Integration of functional and spatial aspects in the context of rural development.
- Topic 3:** Regionalization and the delineation of planning region, Levels of planning - national, regional, sub-regional and local. Need and scope of regional planning. Steps of planning.
- Topic 4:** Risk Components in land use planning.
- Topic 5:** Risk reduction issues in land use planning, Integration of Risk Information into planning
- Topic 6:** Disaster Risk Reduction Enhanced Land Use Planning (LUP), Importance of Disaster Risk Information in LUP, Steps adopted in Disaster Risk Sensitive Land Use Planning (DRSLUP), Enabling environment for incorporating disaster risk information in LUP.
- Topic 7:** Urban Resilience and its implication in Urban Risk Management.

Learning Outcomes:

By the end of the course students will be able to learn

- Understand the definition, objective and scope of land use planning
- Identify the various urban functions, activities and land use components
- Analyze the social and cultural characteristics of rural communities
- Understand the concept, nature and scope of integrated rural development
- Distinguish between national, regional, sub-regional and local levels of planning
- Discuss the need and scope of regional planning
- Identify risk components in both urban and rural planning
- Understand risk reduction issues in urban and rural planning
- Discuss the importance of disaster risk information in land use planning
- Identify steps adopted in disaster risk sensitive land use planning
- Understand the enabling environment for incorporating disaster risk information in LUP
- Understand the concept of urban resilience and its implication in urban risk management

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. Experiential learning techniques like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem-solving and hands on learning are encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Dewberry L.N. Davis. (2008) Land Development Handbook. 3rd Edition. McGraw-Hill. US.
2. George C.K. (2007) Basic Principles and Methods of Urban and Regional Planning. 3rd Edition. Libro-Gem Books. Lagos.
3. Hall P. Jones M.T. (2010) Urban and Regional Planning. 5th Edition. Routledge. UK.
4. Institution of Civil Engineers. (1995) Megacities: Reducing Vulnerability to Natural Disasters. Thomas Telford. UK.
5. Vale L.J. Campanella T.J. (2005) The Resilient City: How Modern Cities Recover from Disasters. Oxford University Press. UK.

Course Number and Title: DPMT 5008 Gender Equality and Social Inclusion in DRM

Credit: 02

Introduction to the Course:

This course is designed to critically examine the Gender Equality, Disability and Social Inclusion (GEDSI) elements. Special emphasis will be placed on the governance of Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) since they have a significant impact on how different groups of people feel the effects of disaster risk. Moving beyond concepts and principles, the course looks at how Gender Equality and Social Inclusion (GESI) can be operationalized in the DRM context.

Specific Objectives:

This course aims to help the professionals and practitioners to manage DRR and DRM projects that incorporate GEDSI. This course is designed to ensure the most vulnerable populations across diverse groups are prioritized and involved in decision-making processes for humanitarian response, recovery, preparedness, and risk reduction. Moreover, this course will help to widen the understanding, knowledge, and skills of the professionals. This course aims to operationalize gender equality into DRR and DRM programming. It will enable participants to integrate GESI concepts and principles into their preparedness for response and recovery plans and programs. The output of the course will be an action plan that participants should work on when they return to their organization.

Course Contents:**Topics**

- Topic 1:** Gender and Gender Relations in Disasters
- Topic 2:** A Gender Perspective on Disaster Risk Reduction (DRR)
- Topic 3:** Integrating a Gender Perspective into Disaster Risk Management (DRM): An Analysis of the Global Assessment Reports on Disaster Risk Reduction
- Topic 4:** Balancing Gender Vulnerabilities and Capacities in the Framework of Comprehensive Disaster Risk Management
- Topic 5:** Mainstreaming Gender in Emergency Response and Resilience: Immediate Strategy and Long-Term Strategy, Gender in Policy Framework (International and Bangladesh perspective)
- Topic 6:** Understanding Gendered Context of Post-Disaster Recovery: An Overview
- Topic 7:** Gender, Development and Disasters
- Topic 8:** Disability and Disasters: Enhancing Disaster Preparedness and Resilience of People with Disabilities
- Topic 9:** Social Exclusion and Disaster: Exclusion based on Class and Caste system, Age, Race, Ethnicity, Religion and Minority
- Topic 10:** Practicing Social Inclusion: Inclusion in Policy, Community Life and Research
- Topic 11:** Strategies to Promote Social Inclusion
- Topic 12:** Intersectionality: Definition, Intersectional Justice, Forms and Key Concepts and Practical Application
- Topic 13:** Policy, Planning and Legal Aspects of Inequality Issues in Disasters

Learning Outcomes:

By the end of the Course the professionals will be able to:

1. Understand the concept of gender dynamics with specific focus on the different needs and priorities of women, men, young girls and boys before, during and after disasters.
2. Explore gender-sensitive strategies and tools for gender analysis, mainstreaming gender and gender-responsive budgeting in policies and programmes.

3. Compare the ways in which social groups differ in experiencing natural hazards and disasters.
4. Design strategies for equitable service delivery and socio-economic empowerment of disabled people and other marginalized groups.
5. Compare different approaches for meaningful inclusion of marginalized groups in development initiatives.
6. Critically analyse the principles of social justice, which may be employed to reduce vulnerability among socially marginalized populations.

Instructional Strategies:

Visual aids like Multimedia will be used to present lectures. All the materials will be provided in soft copies or hard copies. Soft copies will be provided through a common group email account. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. Students are expected to be enthusiastically involved in the classroom activities. In addition, problem solving and on-line discussions will be highly appreciated.

Assessment:

Formative (50%): In course Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Bacchi, C. (1999) *Women, Policy and Politics: The Construction of Policy Problems*. 1 Oliver's Yard, 55 City Road, London EC1Y 1SP United Kingdom: SAGE Publications Ltd. doi:10.4135/9781446217887.
2. Bank, A.D. (2020) *Enhancing Women-Focused Investments in Climate and Disaster Resilience*. Asian Development Bank.
3. Bradshaw, S. (2013) *Gender, Development and Disasters*. Edward Elgar (EBL ebooks online).
4. Enarson, E. and Chakrabarti, P.G. (2009) *Women, Gender and Disaster: Global Issues and Initiatives*. B-42, Panchsheel Enclave, New Delhi 110 017 India: SAGE Publications India Pvt Ltd. doi:10.4135/9788132108078.
4. Liamputtong, P. (2022) *Handbook of Social Inclusion: Research and Practices in Health and Social Sciences*. Springer International Publishing.
5. Mitchell, D. and Karr, V. (2014) *Crises, Conflict and Disability: Ensuring Equality*. Taylor & Francis (Routledge Advances in Disability Studies).
6. Rimmerman, A. (2013) *Social Inclusion of People with Disabilities: National and International Perspectives*. Cambridge University Press (Cambridge Disability Law and Policy Series).
7. Roy, S. (2022) *Gender and the Politics of Disaster Recovery: Dealing with the Aftermath*. Taylor & Francis (Routledge Research in Gender and Society).
8. Taket, A. et al. (2013) *Practising Social Inclusion*. Taylor & Francis.

Course Number and Title: DPMT 5009 Geographic Information System (GIS) and Remote Sensing

Credit: 03

Introduction to the Course:

This course is for introducing the students with the Geographic Information Systems (GIS) and Remote Sensing. GIS is a system for geospatial data capturing, editing, manipulating, storing, analyzing and presentation. Remote Sensing has become the ideal method for both rapid and detailed investigations. The technique allows the ability to investigate from a distance, conveniently eliminating the time required for mobilization, especially during post disaster damage and need assessment. GIS plays a major role in the field of Disaster Risk Reduction and Climate Change studies by answering the five questions – 1. Location what is at...? 2. Situation/Condition where does it exist? 3. Trends what has changed since...? 4. Patterns what spatial patterns exist? 5. Modeling What if...?

Specific Objectives:

This course assists students to learn about Geographic Information Systems (GIS) basics, the principles of remote sensing, learn the typology of remote sensing, mechanism and processing of data, and their application in the field of Disaster and Climate Resilience studies.

Course Contents:

Topics

- Topic 1:** Introduction; Scope; Concepts and Principles of GIS and Remote Sensing; Types of Remote Sensing
- Topic 2:** Electromagnetic Radiation; Interaction with Atmosphere and Earth Surface
- Topic 3:** Sensors, Sensor Types and Sensor Characteristics, Data Acquisition and Selection
- Topic 4:** Visual Interpretation
- Topic 5:** Change Detection
- Topic 6:** Microwave, LiDAR and Hyperspectral
- Topic 7:** Introduction to Desktop and Online GIS Applications: ArcGIS, QGIS, Google Earth, OSM
- Topic 8:** Data and Information: Data Type, Typology: Spatial Relationship
- Topic 9:** Map Projection and Coordinate System: Reference Surface for Mapping, Map Projections, Coordinate Transformations
- Topic 10:** Data Entry and Preparation: Data Acquisition, Digitizing from Existing Documents, Data Preparation, Map Standards and Design
- Topic 11:** Data Quality: Accuracy, Precision
- Topic 12:** Network and Network Analysis, Vector Analysis: Overlay: Intersect, Clip Overwrite; Neighborhood Operation: Buffer and Thiessen Polygon
- Topic 13:** Raster Analysis: Measurement: Location, Distance, Area Size, Classification, Overlay: Arithmetic Operation, Comparison Operators, Logical Operators, Conditional Expressions, Decision Tables
- Topic 14:** Creating Spatial Data from primary and secondary sources, Data Editing, Geoprocessing, Spatial and Network Analysis, Map Presentation, Database and Table
- Topic 15:** Application of GIS and Remote sensing in Disaster Management

Learning Outcomes:

- Understand the principles of remote sensing and GIS

- Understand different sensors and their variations
- The preprocessing and processing of data
- Interpretation of image.
- Understand georeferencing of spatial datasets, Geospatial Data, Projection, Cartography.
- Create projection and change coordinate systems of spatial datasets.
- Create vector data by digitizing Hardcopy map / Satellite image / Google Earth, GPS survey.
- Understand data editing, topology building, data processing storing and linking spatial data with non-spatial data
- Create symbol and make map (cartography) for presentation
- Different applications in disaster management

Instructional Strategies:

Visual aids like Multimedia will be used to present lectures. All the materials will be provided in soft copies or hard copies. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. Students are expected to be enthusiastically involved in the classroom activities. In addition, problem solving, and on-line discussions will be highly appreciated.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Lillesand T.M., Kiefer R.W. and Chipman J.W. (2004) Remote Sensing and Image Interpretation. 5th edition. Wiley-Blackwell. US.
2. ITC (2010) A Core Book of Geo-information Science and Earth Observation: A System based Approach.
3. Rashed T. and Jurgens C. (2010) Remote Sensing of Urban and Suburban Areas. Springer. Netherlands.
4. Weng Q. (2009) Remote Sensing & GIS Integration: Theories, Methods and Applications. McGraw Hill. US.
5. Bonham-Carter G.F. (1991) Geographic Information Systems for Geoscientists: Modeling with GIS. Elsevier. UK.
6. Decker D. 2001. GIS Data Sources. Wiley-Blackwell. US.
7. ITC (2010) A Core Book of Geo-information Science and Earth Observation: A System based Approach.
8. Tasha W. Shelly S. (2006) A to Z GIS: An Illustrated Dictionary of Geographic Information Systems / Edition 1, RIC International

Course Number and Title: DPMT 5010 Legal and Institutional Arrangement for Disaster Risk Management

Credit: 02

Introduction to the course: Legal and institutional arrangements (LIA) is an important step towards mainstreaming Disaster Risk Management (DRM) in local processes, functions, and services. The legal aspect of LIA focuses on the policy environment; as characterized by laws, regulations, codes, and ordinances, which provide the legal basis for national and local-level DRM activities. The institutional aspect delves on the administrative, functional and

operational capabilities of the different organizations that are involved in DRM within a given jurisdiction. These functions include risk identification, information dissemination, planning, policy formulation and enforcement, and inter-organizational and cross-sectoral coordination. This course has two major components. In the first stage of the learning the focus is given towards the theoretical aspects of LIA and DRM. This part mainly reviews the existing theories of institutions, policy & planning, good governance etc. In the second part of the learning, the emphasis is given for the practical aspects of LIA. It reviews the major policy instruments, legal as well as institutional arrangements for DRM both from the local and global perspectives.

Specific objectives:

The course aims to:

- Develop a concrete foundation on the theoretical aspects of legal and institutional framework required for disaster risk governance
- Analyze the existing legal and institutional arrangements for DRM in Bangladesh as well from global perspective.
- Maps out the intricacies of inter-institutional coordination processes and protocols that would align and harmonize the DRM process

Course Contents:

Topics

Topic 1: Theoretical aspects of Institutions and Governance; Institutional Theory, why institutions matter in Climate Resilience, types of Institutions and their Roles in Disaster Management and Climate Resilience, Principles of Good Governance.

Topic 2: Governmental Disaster Management Agencies; Government Emergency Management Structures: Fire Departments, Law Enforcement, Emergency Management and Civil Protection, Emergency Medical Services, Public Health, The Military and other Institutions.

Topic 3: Bilateral Disaster Management Assistance: Different types of Foreign Assistance, how governments provide Bilateral Assistance, Monetary Assistance, Equipment and supplies, Expertise.

Topic 4: Government Agencies Involved in Bilateral Assistance: Overseas Diplomatic Missions, International Development Agencies, National Disaster Management Agencies, Other Government Agencies and Military Resources.

Topic 5: Nongovernmental Organizations: Types of Nongovernmental Organizations involved in Emergency Management, The Emergency Management role of Nongovernmental Organizations, The Private Sector, Academia

Topic 6: Nongovernmental Emergency Management Operations: Funding, Coordination, NGO / Military Cooperation, Standards of Conduct, Case Study (The International Federation of Red Cross / Red Crescent Societies).

Topic 7: Multilateral Organizations: Multilateral Organizations Explained, Regional International Organizations, The Emergency Management role of Multilateral Organizations.

Topic 8: The United Nations: The United Nations System, United Nations Agencies and Programs, The United Nations role in Emergency Management, The Consolidated Appeals Process, Disaster Management Act, Law, Plan and Policy: their Guidelines.

International Instruments: Hyogo Framework for Action, SAARC Framework for Action, UNHABITAT, Disaster Management Act, Law and Policy in Bangladesh.

Learning Outcomes:

By the end of the course students will be able to learn:

- The institutional theories and their current state of evolution
- The role of good governance in achieving sustainable development.
- The role of different formal and informal institutions in the disaster management of Bangladesh.
- The international institutional context of disaster management and climate resilience.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands-on field learning is encouraged.

References

1. Ansell J. and Wharton F (1992) Risk: Analysis, Assessment, and Management. Wiley-Blackwell. US.
2. Asian Development Bank (ADB) (2005) Review of Asian Development Bank Policy and Assistance. Manila.
3. Asian Disaster Reduction Center (2005) Total Disaster Risk Management: Good Practices.
4. Broadleaf Capital International (1999) The Australian and New Zealand Standard on Risk Management. Broadleaf Capital International. Pymble. Australia.
5. Commonwealth of Australia (2004) Emergency Risk Management: Applications Guide. 2nd Edition. Emergency Management Australia. Australia.
6. Coppola D.P. (2011) Introduction to International Disaster Management. 2nd Edition. Butterworth Heinemann Press. US.
7. Ministry of Disaster Management Relief, Government of the People's Republic of Bangladesh (2010) National Plan for Disaster Management. Dhaka.
8. National Disaster Management Legal Frameworks: Plan, Policy, Act and SOD

Course Number and Title: DPMT 5011 Humanitarian Emergency and Crisis Management

Credit: 02

Introduction to the Course:

The world is currently dealing with a number of humanitarian emergencies and crises owing to disaster and climate change. Students will learn in-depth concepts regarding humanitarian emergencies and crises, as well as their causes, effects, and management, in this course.

Specific Objectives:

To get complete ideas about the origin of humanitarian emergencies and crises along with management procedures to reduce their impacts.

Course Contents:

Topics

- Topic 1:** Complex Humanitarian Emergency, Origin and evolution of the definition. The local, national and international actors in humanitarian emergencies.

- Topic 2:** Practical and conceptual problems with a humanitarian crisis, Uncertainty on how and when to intervene. The difficulties in linking relief, rehabilitation, and development, Declining resources and disparities in allocation. The roles and management of the organizations involved interorganizational coordination and competition, as well as the tension between organizational control and local participation.
- Topic 3:** Root causes of humanitarian crisis: breakdown of societies. Authoritarianism and corruption, Development failures and structural adjustment, Colonialism, War. Resource constraints and impacts of improper planning.
- Topic 4:** Humanitarianism, Theory, and practice of humanitarian intervention, Three Grotian Theories of Humanitarian Intervention, Eight Theories of Humanitarian Intervention
- Topic 5:** Humanitarian interventions. Types of intervention: military (peacekeeping) or civilian. Prevention, Peacemaking, and Rebuilding. Difference of complex humanitarian emergencies from long-term deprivation?
- Topic 6:** Humanitarian actors and coordination. Roles of military, Media, Donor, Country, Governments. NGOs: Funding arrangements and the broader issue of donors and their policies. UN System: Roles, responsibilities, and mandates. Roles of states and national sovereignty. Execution of programs & examples of UN-led humanitarian interventions: political rationale, funding levels, assignment for leadership and coordination. Regional Organizations. The aid chain and coordination. The expectations that accompany external aid.
- Topic 7:** Outcomes of actions: conflict resolution, refugee resettlement, social and political reconstruction. Coping mechanisms, capacities, capabilities, and vulnerabilities. Participation.
- Topic 8:** Importance of a long-term development perspective: lives and livelihood, linkages among political aspects, human rights, and participation.
- Topic 9:** Water and Sanitation, Livelihoods and Food Security in Humanitarian Crises, Nutrition in Humanitarian Crises, Management of Diseases in Humanitarian Crises, Shelter in a Humanitarian Setting, Protection of Displaced Populations: Human Rights & Humanitarian Law, Emerging Risks, Challenges, and Opportunities for Future Humanitarian Emergencies. Examples from Palestine; Exodus from Middle East, North Africa, South America; and Forcibly Displaced Myanmar Nationals (Rohingya).
- Topic 10:** The criticism on humanitarianism (De Waal) and the response, Ethics and Humanitarian Standards, SPHERE, HAP, Southern challenges

Learning Outcomes

- To learn what is emergency and crisis and their causes.
- To learn how to manage emergency and crisis
- To get an overview of world's present emergencies and crises.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. Experiential learning techniques like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem-solving and hands-on learning are encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Moore, J. (1998) *Hard Choices*, Introduction & Ch. 1, pp. 1-28.
2. Weiss, T. G., Collins, C. (2000) *Humanitarian Challenges and Intervention*, (Ch. 1: Evolution of the Humanitarian Idea) Westview Press, second edition, pp. 13-38.
3. Keen, D. (1998) *The Economic Functions of Violence in Civil Wars*, Adelphi Paper, 320, The International Institute for Strategic Studies, Oxford University Press, Oxford, 88 pp.
4. Lee, S.P (2010) HUMANITARIAN INTERVENTION—EIGHT THEORIES. In
5. *Diametros* № 23 (March 2010): 22-43 22.
6. Totten, S. & Parsons, W.S. (edited) (2013) *Centuries of Genocide: Essays and Eyewitness Accounts* (4th Edition). Routledge: New York.
7. Donini, A. (1995) *Beyond Neutrality: On the Compatibility of Military Interventions and Humanitarian Assistance*, *The Fletcher Forum of World Affairs*, pp. 31-45.
8. Anderson, M.B. (1999) *Do No Harm: How Aid Can Support Peace ¾ Or War*, Lynne Rienner Publishers, Boulder.
9. Curtis, D. (2001) *Politics and Humanitarian Aid: Debates, Dilemmas, and*
10. *Dissension*, HPG Report 10, Humanitarian Policy Group, Overseas Development Institute,
11. London. (<http://www.odi.org.uk/hpg/papers/hpgreport10.pdf>)
12. Jackson, S., P. Walker (1999) *Depolarizing the 'Broadened' and 'Back-to-Basics' Relief Models*, *Disasters*, 1999, 2, 93-114.

Course Number and Title: DPMT 5012 Project Management and Monitoring

Credit: 02

Introduction to the Course:

This course is designed to equip us with comprehensive knowledge and skills in the dynamic field of project management. Throughout this course, we will delve into essential concepts, methodologies, and practical tools that form the foundation of effective project planning, execution, and evaluation.

Specific Objectives:

This course aims to equip participants with advanced project management skills, emphasizing comprehensive planning, effective project appraisal, and the application of the Logical Framework Approach. Participants will develop expertise in crafting sound project plans, evaluating projects from multiple perspectives, and implementing robust monitoring and evaluation systems for successful project outcomes.

Course Contents:

Topics

Topic 1: Basic Concepts: Definition & characteristics of a project & program, Difference between project and program, Project and programme managers role; Project

classification & their differences, Understanding project objective, Project life cycle, aspects and activities of different phases, project generation and screening.

Topic 2: Project Planning and Proposal Development: Definition, purpose, processes, steps, tips, elements, Project processing and procedure in Bangladesh, Guidelines for planning, Project Proformas, Uncertainty and Risk in Project Planning, Reasons behind project failure.

Topic 3: Project Appraisal: Different aspect of project appraisal-technical aspect, managerial aspect, social aspect, economic aspect, financial aspect. Determination of investment worth, cash flow in a project, Steps involved in Approval Process of Investment Projects.

Topic 4: Logical framework approach in project management: definitions and use, nine different steps in LFA, building a logframe matrix, Elements of Project Management.

Topic 5: Project Monitoring & Evaluation: Definitions, purpose and objectives, elements and components of a good M&E System, M&E Plan and results framework, Characteristics of a good indicator, Monitoring report, methods and types of evaluation.

Learning Outcomes:

By the end of the course students will be able to learn:

- How to demonstrate proficiency in crafting comprehensive project plans, integrating risk assessment, and budget management for successful project execution.
- Participants will develop the ability to conduct thorough project appraisals, considering technical, social, economic, and financial dimensions, ensuring informed decision-making and project success.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands-on field learning is encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References

1. Chadha S. (1989) Managing Project in Bangladesh. University Press Limited. Dhaka.
2. Choudhury S. (1993) Project Management. Tata McGraw Hill Publishing Co. New Delhi
3. Dingle J. (1997) Project Management: Orientation for Decision Makers. John Wiley-Blackwell. US.
4. International Labor Organization. (2000) Project Preparation, Implementation, Monitoring, Evaluation: User's Hand Book. Dhaka.
5. NORAD. (1999) The Logical Framework Approach. Oslo.
6. Young T. (2003) The Project Management Manual. Penguin books. New Delhi.

Course Number and Title: DPMT 5013 Damage and Loss Assessment: Disaster and Climatic Context

Credit: 02**Introduction to the Course:**

The course has three major focus areas. They are the damage, loss and need assessment in the post disaster context. This course discusses about the established methods of damage and loss assessment and their application in different socioeconomic sectors. The sector specific damage and loss assessment follows the post-disaster need assessment.

Specific Objectives:

The specific objective of this course is to introduce the students with the established methods for disaster damage, loss and need assessment. Several agencies of the UN and some other international bodies have developed some toolkits on this purpose. This course aims to teach about these toolkits and talk about them by providing practical examples.

Course Contents:**Topics**

- Topic 1:** Introduction: Concept of disaster damage and losses; Factors causing increase in damage and losses;
- Topic 2:** Damage and Loss Measures: Assessment versus estimation; Concept of Post-disaster Needs Assessment (PDNA); Concept of disaster damage and loss assessment (DaLa); Concept of pre-disaster loss estimation (PDLE).
- Topic 3:** Assessment Methodology: ECLAC, DaLa, PDNA.
- Topic 4:** Steps in the Application of ECLAC (Economic Commission for Latin American and Caribbean region) Methodology.
- Topic 5:** Conducting Damage and Loss Assessments by Sector: Economic Sector, Social Sector, and Infrastructure and Cross Cutting sectors.
- Topic 6:** Post Disaster Need Assessment (PDNA): From Losses to economic Recovery Plan, From Damage to reconstruction Needs.
- Topic 7:** Link between Risk Assessment and Damage Assessment
- Topic 8:** Latest Loss Estimation Modeling and Disaster Impact Analysis for Effective Policy Formation: Cost Benefit Analysis, HAZUS (Hazard in USA) Methodology, Computable General Equilibrium (CGE) Model, the Social Accounting Matrix (SAM) Method and Econometric Model.

Learning Outcomes:

By the end of the course students will be able to learn:

- The damage, loss and need assessment techniques
- The methods for developing context specific disaster assessment toolkits.

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. The techniques of experiential learning like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem solving and hands on field learning is encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References

1. Chakrabarti D. Bhat M.R. (2006) Micro-finance and Disaster Risk Reduction. Knowledge World. India.

2. Coppola D.P. (2007) Introduction to International Disaster Management. Elsevier. UK.
3. Hansjurgens B. Antes R. (Ed.) (2008) Economic Management of Climate Change Risk Mitigation Adaptation. Springer. Netherlands.
4. The World Bank. (2010) Damage, Loss and Needs Assessment: Guidance Notes. Washington DC.
5. GFDRR. (2013) Post Disaster Need Assessment Guidelines: Volume A.
6. GFDRR. (2008) Disaster Damage, Loss and Need Assessment: Training Guidelines. Dhaka. Bangladesh.

Course Number and Title: DCRPMT 5014 Climate Change Adaptation and Climate Financing

Credit: 03

Introduction to the Course:

Specific Objectives:

Students will be able to learn about climate change adaptation and essentials of climate financing.

Course Contents:

Topics

Topic 1: Earth's Changing Climate, Global Warming, Greenhouse Gases, Consequences of Climate Change, RCPs, Climate Change Impacts and Vulnerabilities;

Topic 2: Response to Climate Change: Adaptation and Mitigation Measures, Differences between Climate Change Mitigation and Climate Change Adaptation, loss and damage issue in global climate change dialogue, climate change and green recovery

Topic 3: National, Regional and International Response to Climate Change: International Treaties, Protocols, IPCC, and UNFCCC (COP: historical development, success and failure), Kyoto protocol; The Paris Agreement; Nationally Determined Contributions

Topic 4: Climate Change in the Context of Bangladesh: Climate Change and Bangladesh, Bangladesh Climate Change Strategic and Action plan, National Adaptation Program of Action (NAPA), Climate Fund Use and Misuse: National and International (BCCTF: Bangladesh Climate Change Trust Fund, BCCRF: Bangladesh Climate Change Resilient Fund)

Topic 5: Climate Change and Climate Politics: grouping among countries (Annex I, Annex II, Non-Annex, OECD, EIT, AOSIS, LDC, etc), Clean Development Mechanism (CDM), Carbon Trading, National and Individuals' Interest, Climate Ethics and Justice, Carbon footprint; Equity and Responsibility in the UNFCCC; The Climate Game and the World's Poor; Climate Refugees; Climate Justice and Communities of Color

Topic 6: Climate Financing, Adaptation vs. Mitigation Issues in the Climate Negotiation; Market-Based Solutions: Payments for Ecosystem Services; Carbon Markets and Economic Tools; Green Finance; Critics and Complications of Climate Legislation; National Interests and Coalition in Climate Negotiation; Advocacy Coalitions

Learning Outcomes:

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

- Define climate change adaptation and mitigation
- Explain global institutions and policies on climate change

- Understand different aspects climate politics and financing

Instructional Strategies:

Visual aids like Multimedia alongside whiteboard writings will be used to present lectures. All the materials will be provided. Teaching methods will be: lectures, group discussion, exercises, case studies, assignments and presentations. Experiential learning techniques like role play, question and answer sessions, practical research and report writing will be used to increase participation. In addition, problem-solving and hands on learning are encouraged.

Assessment:

Formative (50%): Incourse Examination/Assignment /Presentation

Summative (50%): Course Final Examination

References:

1. Asian Development Bank (ADB) (1994) Climate Change in Asia: Bangladesh Country Report. Manila. Philippines.
2. Erda L., Bolhofer W.C., et al. (1996) Climate Change Vulnerability and Adaptation in Asia and the Pacific. Springer. Netherlands.
3. Acemoglu, D. and Robinson; J. 2012. "Theories that don't work" and "The making of prosperity and poverty". Why Nations Fail: The origins of power, prosperity and poverty. UK: Profile Books.
4. Agarwal, Anil and Sunita Narain. 2015. "Environmental Colonialism: The Perverse Politics of Climate Change." Except reproduced in Global Environmental Politics: From Person to Planet. Simon Nicholson and Paul Wapner (eds.) Boulder, London: Paradigm Publishers. Pages 233-237.
5. Gardiner, S.M. 2006. A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption. Environmental Values 15 (2006): 397-413

Course Number and Title: DPMT 5015 Research Methodology and Thesis

Credit: 06

Introduction to the Course:

The goal of Research Methodology is to learn how research is being done, and to put that knowledge into practice. The primary objective of this course is to reacquaint professionals with a variety of research traditions and related methodological and epistemological issues. First, the course will look at what it means to do research, the role of power in research relationships, and challenges posed by quantitative and qualitative data as well as critical research practices and mixed methods approaches. Secondly, students will have the opportunity to choose a research topic of their interest. With the guidance and support of faculty members, they will conduct in-depth research and present their findings both verbally (presentation) and in written form.

Specific Objectives:

This course will help professionals to understand research terminology, be aware of the ethical principles of research, ethical challenges and approval processes, to describe quantitative, qualitative and mixed methods approaches to research, to identify the components of a literature review process and to critically analyse published research. This course will also help to learn how to conduct research independently in a group under the supervision of faculty members.

Course Contents:

Topics

- Topic 1:** Research Methodology: An Introduction
- Topic 2:** Concept Measurements, Challenges and Constraints in Conducting Research
- Topic 3:** Literature Review
- Topic 4:** Formulating Problems, Objectives and Questions, Assumption and Hypothesis
- Topic 5:** Research Methods: Pre-field work, Field Work, without Field Work
- Topic 6:** Citation and Reference List; Bibliographic Engines e.g., Mendeley
- Topic 7:** Critical Reading and Technical Writing, Argumentation
- Topic 8:** Ethics and Professionalism in Research
- Topic 9:** Data and Data Collection Methods:
Data, Measurement Scale, Sampling Methods, Type of Data (Primary and Secondary), Sources of Data (Primary and Secondary), Data Collection Methods Quantitative, Qualitative (Observation Methods, Questionnaires, Methods, Interview, RRA/PRA, FGD); Quantitative Data Analysis, Interpretation and Result Validation Methods: (Univariate Methods, Bivariate Methods, Time Series Analysis, Signal Processing, Spatial Analysis, Image Processing, Multivariate Analysis and Directional Data Analysis).
- Topic 10:** Thesis Work

Learning Outcomes:

By the end of the course students will be able to learn

- Develop research skills such as selecting and defining a research problem, conducting literature review, and data collection and analysis
- Gain experience in presenting research findings in both oral and written formats
- Develop critical thinking and analytical skills
- Enhance knowledge in a particular area of interest
- Learn how to work independently and under the guidance of a supervisor
- Acquire skills in academic writing and proper citation techniques
- Gain exposure to the research process and the rigor involved in conducting research.

Instructional Strategies: Students will get supervision from faculty members from the department and professionals in the industry. They must present and defend their research proposal (presentation). During the final examination, they must defend (through presentation) their research thesis and must submit written copy for evaluation.