



**Master of Science in
DISASTER RISK ENGINEERING AND MANAGEMENT**

Courses of Study (Syllabus)
(First Revision)

(Approved by the Subject Committee of Buddhist Architecture and Engineering on December 13, 2021, and consequently endorsed by the Faculty Board on December 23, 2021, and Academic Council on December 25, 2021)

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THE CONTEXTS

Lumbini Buddhist University (LBU) was established in Lumbini through LBU Ordinance in 2004 in response to the 1st World Buddhist Summit in Lumbini in 1998 and later endorsed by its own Act in 2006.

As outlined in its 2030 Vision Seven Initiatives, LBU expanded its programs by creating the School of Development Studies & Applied Sciences (SDSAS) in accordance with Article 9D of its Act and by the decision of its 11th Senate Meeting held on August 14, 2019, in Lumbini.

In accordance with decision number 6 of the 11th Senate held in Kathmandu on August 14, 2019, and as per the instruction of the Executive Council following on clustering of academic programs, the decision was made by a meeting of Deans chaired by the Vice-Chancellor on October 3, 2019, to include the ongoing two programs such as MSc in Construction Engineering & Management (CEAM) and MSc in Disasters Risk Engineering & Management (DREM) within the domain of SDSAS.

The three master-level engineering management programs that were approved by the LBU's 7th Senate held in Kathmandu on June 16, 2016, are as follows:

- i. M.Sc in Construction Engineering & Management,
- ii. M.Sc. in Disasters Risk Engineering & Management, and
- iii. M.Sc. in Rural Infrastructure Engineering.

Upon receiving LBU's letter of affiliation dated December 13, 2015, the Lumbini International Academy of Science and Technology (LIASST) had started two programs such as

- i. M.Sc. in Construction Engineering & Management, and
- ii. M.Sc. in Disasters Risk Engineering & Management.

With the purpose of mainstreaming the ongoing programs, LBU's 135th Executive Committee Meeting held on June 15, 2020, formed a team to explore the scope and feasibility of master-level engineering programs to address Buddhist architecture, monuments, heritage, and landscapes. Upon completion of over three and half months of consultative study, the team submitted its report with recommendations including the followings:

Maintain Unique Characteristics of the Lumbini Buddhist University: While developing academic programs in architecture and engineering, it is essential for LBU to maintain its unique characteristics of Buddhist philosophy as envisaged in the declaration of the 1st World Buddhist Summit held in Lumbini in 1998, and the LBU Act 2006 with amendments in 2020 as specifically reflected in the **Preamble** and the **Article 3 (sub-article 1)**.

Continue Existing Programs: The two ongoing programs namely 1) MSc in Construction Engineering Management, and 2) MSc in Disaster Risk Engineering Management should be continued, since these programs have been implemented successfully since the affiliation was granted on December 13, 2015, with endorsement by the Senate on June 16, 2016. However, the syllabus of both the programs should be reviewed from the perspectives of LBU's Act and vision as mentioned above in Unique Characteristics and the UGC's 2016 Higher Education Qualification Framework Nepal.

THE PROGRAM

Program Course Title

MSc in Disaster Risk Engineering and Management (MSc DREM)

The objective of the Program

This master's degree course in Disaster Risk Engineering and Management with theory, practical, and research components aims to meet the growing need for experts trained to provide solutions to complex issues in disasters. In our Master's program, students explore the reduction of risk and disasters, along with their associated impacts, from a diverse range of scientific, engineering, technical, socio-economic, environmental, ethical, and cultural perspectives. All the subjects are designed to give global perspectives but also with special relevance to Nepal's country context.

The course aims to produce disaster risk reduction managers who can work, innovate and lead in a multi-disciplinary environment.

To achieve the objective, the MSc in Disaster Risk Engineering and Management Program of LBU offers Main Core Courses and diversified Elective Courses with many case studies, project works and their research works on this particular field.

It is envisioned that the graduates of this program will be capable to manage disaster-related projects and carry research projects in the area of disaster risk engineering and management.

Entry Requirements for Admission

The minimum requirement to apply for admission into the program is a 4 years Bachelor of Science (Natural or Applied) or Bachelor of Engineering (BE) from a recognized university. Students who have 2 or 3 years of Bachelor Degree and 2 years of Master Degree in Natural Sciences or Applied Sciences or hold an equivalent to an above degree from recognized institutions or universities.

The candidate shall appear and pass the admission test.

Total Credits

The MSc-DREM program offers 60 credits in accordance with the qualification framework for master-level programs as recommended by the University Grants Commission (UGC) (HEQFDT, 2016:8), and also to be compatible with the norms followed at the IoE-TU.

Pedagogy

LBU follows the 2016 Higher Education Qualification Framework as approved by the University Grants Commission. It includes definitions of credit, lecture hour, practical, minimum qualification, and other relevant criteria.

For the purposes of this program also, pedagogical approaches will be based on the UGC's framework as elaborated in **Table 1**.

Table 1. Definitions of Credit Hour

Types of Study (One credit hour equivalent)	Engaged Learning Hours (minimum)	Independent Learning Hours (minimum)	Total Hours
Lecture hour	15	30	45
Hours of lab studies	45	30	75
Hours of field studies	45	30	75
Hours of clinical studies	45	30	75
Hours of industrial training	90	30	120
Hours of self-study or online study or distance study	-	45	45

Source: HEQFDT, 2016

REVISION OF COURSE

Background

Upon the successful completion of two cycles of the courses of MSc in Disaster Risk Engineering and Management (MSc DREM), the revision process was initiated in February 2021 in response to the recommendations made by LBU's study team in October 2020.

The purpose of the revision was to further enrich the course contents and make them compatible with the developing technology in the construction industries.

The course encompasses the efficient skills in project planning, implementation, and control along with cross-cutting issues of technology, quality, contract, safety, financial investment, and environment, policy/legal provisions, and other many contemporary issues.

Criteria of Revision

For the purposes of course and syllabus revision, LBU follows two main bases and standards such as its own Act and decisions, and the framework approved by University Grants Commission (UGC).

LBU Act and Decisions

The Preamble of its Act mentions that LBU should "*... operate high standard educational institutions on Buddhist Philosophy, Literature, Education, Culture and other subjects; to conduct the study, teaching and research programs by promoting peace, fellowship, friendship or goodwill upon accepting the teachings of Lord Buddha as guiding principles of world peace...*" (GON, 2077:31).

Similarly, a decision made in the 11th Senate held on August 14, 2019, stated that LBU should "*... compulsorily incorporate Buddhist philosophy, literature, education, and culture in every subject without compromising on the standards of pedagogy and evaluation system of the programs approved by the academic councils ...*" (LBU, 2019:20).

For expediting LBU's ongoing programs of engineering and also to promote engineering education on Buddhist architecture, LBU signed a Memorandum of Understanding with the Institute of Engineering of Tribhuvan University on November 13, 2020. Accordingly, a subject committee was formed within its domain. In its first meeting held on November 22, 2020, the committee also made the following decision:

"Considering that the syllabuses of both the MSc programs (such as CEAM and DREM) were developed in 2015, it would be appropriate to review them from the following perspectives:

- accommodate in the course contents the contemporary topics like Sustainable Development Goals, and disaster resilience, etc.;*
- reorganize course structure and credits to be compatible with the guidelines of the University Grants Commission; and*
- incorporate Buddhist philosophy in all the courses as appropriate rather than inserting a separate course in isolation."*

(Source: LBU, 2020:5-6)

Method

A revision committee was formed within the scope and objective of the course contents.

Feedback from the construction project engineers/managers, graduates, and faculties were collected. Individual teachers provided their inputs based on their teaching experiences and students' feedbacks. All those inputs were incorporated in the revised courses.

Meetings with individual course teachers have been conducted virtually due to the potential risk of the COVID-19 pandemic. A workshop with minimum faculties and experts was organized at the LIAST college premises following the health protocols for COVID-19 precaution.

The revision of the course on MSc DREM has been accomplished after a thorough review of the present course and recommendations of faculties.

SYLLABUS AND CURRICULUM

Credits

The Master of Science in Disaster Risk Engineering Management (MSc-DREM) degree program includes 11 regular courses (each of 100 marks) and a thesis of 400 marks. In the first semester, all four courses are of foundation level. In the second semester, there are 2 core courses, and one course each to be selected from the two elective groups. In the third semester, there are two core courses, and one elective course to be selected. Thus, the total number of courses will be 11 totaling 44 credits. In the fourth semester, a thesis course of 16 credits will be offered.

Codes

For the purposes of this program, an alpha-numerical Course Code has been adopted. It includes three alphabets representing the program title and three digits reflecting on the semester.

Structure

In line with the semester system of the university, the course structure of the MSc-DREM is as follows (**Table 2**):

Table 2. Course Structure of MSc in Disaster Risk Engineering and Management					
Course Code	Title of Course	Total Credits		Total Credits	Full Marks
		Theoretical	Tutorial		
Year I/I	Semester I				
DREM 511	Principles of Disaster Risk Engineering and Management	3	1	4	100
DREM 512	Earthquake Risk Management	3	1	4	100
DREM 513	Emergency Management Planning	3	1	4	100
DREM 514	GIS and Remote Sensing	3	1	4	100
Year I/II	Semester II				
DREM 551	Research Methodology & Quantitative Techniques (Core Course)	3	1	4	100
DREM 552	Flood Engineering and Disaster Management (Core Course)	3	1	4	100
	Elective I (anyone)				
DREM 553	Community Based Disaster Risk Management	3	1	4	100
DREM 554	Human Resource Management	3	1	4	100
DREM 555	Disaster Prevention, Mitigation and Preparedness with ICT tools	3	1	4	100
	Elective II (anyone)				
DREM 557	Safety Engineering Management	3	1	4	100
DREM 558	Advance Project Management	3	1	4	100
DREM 559	Landslide Risk Management	3	1	4	100
Year II/I	Semester III				
DREM 611	Project Work on Disaster Management	1	3	4	100
	Elective III (anyone)				
DREM 612	Environmental Management	3	1	4	100
DREM 613	Climate Change Adaptation and Mitigation	3	1	4	100
DREM 614	Urban Disaster Risk Management	3	1	4	100
DREM 615	Bioengineering	3	1	4	100
	Elective IV (anyone)				
DREM 616	Disaster Response, Recovery, Rehabilitation and Reconstruction	3	1	4	100
DREM 617	Disaster Risk Management of Cultural Heritages	3	1	4	100
DREM 618	Disaster Law, Policies, Frameworks, and Strategies	3	1	4	100
Year II/II	Semester IV				
DREM 651	Thesis on the relevant topic as prescribed by the Department			16	400
		Total Credit		60	1500

EVALUATION CRITERIA

The end-semester (final) examinations will be based on the following Sections of LBU's 2017 *Academic Administration Rules*:

- *Section 19 Office of the Examinations Controller,*
- *Section 20 Evaluation of Answer Sheets and Archives,*
- *Section 21 Arrangement of Committees on Examinations,*
- *Section 22 Arrangement of Revealing Answer Sheets and Providing Copies,*
- *Section 23 Students' Code of Conducts on Examinations, and*
- *Section 24 Arrangements of Publishing and Suspending Results of Examinations.*

The internal evaluation of students will be based on the *Section 4 Examinations and Evaluation of LBU's 2018 Sub-Rules of Semester System.*

COURSE WITH SYLLABUS

Year I, Semester I

DREM 511 Principles of Disaster Risk Engineering and Management

Year: I; Semester: I	
Principles of Disaster Risk Engineering and Management	Course Code: DREM 511
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective: The objective of this course is to make students familiar with the concepts and principles of disaster risk engineering.

Course Content

Unit 1: Disaster Risk Reduction Terminologies and Concept (12 Hrs)

Disaster, risk, hazard, vulnerability, exposure, extensive risk, forecast, prevention, mitigation, preparedness, residual risk, geological hazard, hydro-meteorological hazard, resilience, acceptable risk, adaptation, capacity, contingency planning, critical facilities, response, rescue, relief, recovery, reconstruction, risk assessment, risk management, risk transfer, risk reduction, disaster management, disaster risk management, prospective disaster risk management, corrective disaster risk management, early warning system, alert and warning dissemination, public awareness, emergency management, disaster risk reduction plan, disaster management cycle, multi-hazard risk management, Community based disaster risk reduction and management (CBDRRM), etc.

Unit 2: Introduction to Disaster (9 Hrs)

Earthquake, Landslide, Flood, Glacial Lake Outburst Flood, Droughts, Volcano, Tsunami, Cyclone, Lightning, Thunderstorm, Fire, Epidemic, Technological Hazard, Human-induced hazards, Industrial hazards, Disasters in Nepal, etc.

Unit 3: Disaster Risk Assessment Tools and Techniques (15 Hrs)

- Defining Risk and Vulnerability, Pressure and Release Model (PAR), Access Model
- Impacts of Disaster on Social, Economic and Physical fabric at Local, National and Global level
- Tools for Vulnerability Assessment (Social, Economic, and Physical)
- Tools for Risk Assessment (Social, Economic, and Physical)
- Disaster Risk Reduction and Management System
- Stakeholders Analysis and DRR Framework

Unit 4: Buddhist Perspective to disasters: (9 Hrs)

- Immigration/migration and future generation: Deterioration of Buddhism as cultural/religious disaster
- Importance of integrating Buddhist perspectives and way of life for DRRM

Unit 5: Tutorial/Practical (15 Hrs)

- Case Study: A hands-on exercise on risk assessment using the latest international framework, such as Inform Risk Index. (<https://DREMkc.jrc.ec.europa.eu/inform-index/INFORM-Risk>)

References

1. UNISDR (2009). Disaster Risk Reduction Terminology, (http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf)
2. Edward A. Keller and Robert H. Blodgett (2007). Natural Hazards. Pearson Prentice Hall

3. Godschalk, D.R. E.J. Kaiser and P.R. Berke. (1998). Hazard Assessment: The Factual Basis for Planning and Mitigation in Burby, Raymond (Ed.). Cooperating with Nature. Washington, DC: Joseph Henry Press.
4. Morrow, B. H. (1999). Identifying and mapping community vulnerability. *Disasters*, 23(1), 1-18.
5. Dahal.R (2006). Geology for Technical Students Bhrikuti Publication,2006 Nepal
6. Cannon, T., Davis, I., Wisner, B., Blaikie, P., & Blaikie, P. M. (1994). At Risk: Natural Hazards. *People's Vulnerability, and Disasters, Hardcover, 284.*

DREM 512 Earthquake Risk Management

Year: I/I; Semester: I	
Earthquake Risk Management	Course Code: DREM 512
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective: This course aims to provide the understanding and knowledge of earthquake risk management in the context of Nepal.

Course Content

Unit 1: Seismology and Earthquake: (6 Hrs)

Meaning of earthquake, Internal structure of the earth, Plate tectonics, Causes of the earthquake, Propagation of elastic waves, Primary waves, Secondary waves, Magnitude and Intensity, Effect of the earthquake, Great earthquakes of the world, and earthquakes of Nepal.

Unit 2: Geotechnical Engineering: (6 Hrs)

Soil structure interaction, pore pressure, bearing capacity of soil, Liquefaction, Ground improvement techniques.

Unit 3: Seismic Risk Analysis: (6 Hrs)

Hazard, vulnerability, Risk, Seismic Risk management, Seismic Risk mitigation, Seismic vulnerability assessment, Seismic risk assessment tool, etc.

Unit 4: Building Code and Bye-Laws: (6 Hrs)

Historical approach, Types, and division of NBC, Need and implementation of NBC, Provisions in Building Act-2055 (BhawanAin 2055), Bye-laws, Municipal building permit systems.

Unit 5: Concept of earthquake resistant design: (6 Hrs)

Introduction, Beam-Column Joint detail, Ductile detailing in the frame structure, Short column effect, The Cause of masonry building failure, Performance of masonry structure in lateral load, Failure of walls due to shear, Bending and Torsion, Earthquake Protection of Building (DPC band, Sill Band, Lintel Band, Corner Stitches, Vertical bars injunctions, Roof Bands), Detail at Junction of wall and beam, Earthquake preparedness and mitigation, etc.

Unit 6: Retrofitting Technique: (6 Hrs)

Introduction, Global and Local Retrofitting Technique, Importance of retrofitting, Techniques of Retrofitting for Masonry and RCC Building, Retrofitting Materials

Unit 7: Buddhist Structures: (9 Hrs)

Understanding the functionality of Buddhist Structures during an earthquake with a detailed assessment

Unit 8: Tutorial/Practical (15 Hrs)

Case Study:

- Hands-on exercise on assessing earthquake risk (hazard, vulnerability, and exposure) in Kathmandu valley
- Cascading effect of earthquake and assessment of cascades

References

1. Arya, A. Set., al (1986).Guidelines for Earthquake Resistant Non-Engineered Construction, International Association for Earthquake Engineering
2. FEMA (1998).Handbook for the Seismic Evaluation of Existing Buildings. Federal Emergency Management Agency (FEMA), Washington D.C

3. GON/ Building Act (1998). Government of Nepal
4. GON/MPPW., UNDP/ERRRP (2009). Report of the Training Program on Earthquake Resistant Design of Buildings / Nepal National Building Code and its Implementation Strategy for Municipal Engineers Final Report. Ministry of Physical Planning and Works, Government of Nepal
5. GON/MPPW/DUDBC, UNDP/ERRRP (2011). Engineers training on Earthquake Resistant Design of Buildings, Volume I – Seismicity and design aspects. Ministry of Physical Planning and Works, Government of Nepal
6. JICA (2002). The Study on Earthquake Disaster Mitigation in the Kathmandu valley Nepal, Japan International Cooperation Agency (JICA) and Ministry of Home affairs
7. MOHP (2002). A Structural Vulnerability Assessment of Hospitals in Kathmandu Valley. Kathmandu: Ministry of Health, Department of Health Services, Epidemiology & Disease Control Division.
8. Government of Nepal (1994). National Building Revision 2003
9. NSET (2002). Protection of Educational Building Against Earthquakes: A Manual for Designers and Builders. Kathmandu: National Society for Earthquake Technology-Nepal.
10. UNDP (2007), Earthquake Risk Reduction and Recovery Preparedness Programme for South Asian Region. International Recovery Platform.

DREM 513 Emergency Management and Planning

Year: I/I; Semester: I	
Course Title: Emergency Management and Planning	Course Code: DREM 513
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to make students familiar with the theory and practices of emergency management planning with reference to Nepal.

Course Content

Unit 1: Conceptual and Methodological Issues (3 Hrs)

1. Types of disasters and post-disaster stages
2. Classification of damages and effects
3. Social, infrastructure, economic, environmental, and overall effects of damages
4. Humanitarian principles, Humanitarian Standards, SPHERE Standards, Humanitarian data standards

Unit 2: Databases and Disaster Information (6 Hrs)

1. Types and sources of disaster-related data and information, national database (DRR portal, BIPAD), International database (Desinventar, EmDat, etc.)
2. Developing appropriate databases at the community level to the national level
3. Database coordination, sharing, and communication over time and space

Unit 3: Social and Economic Impact assessment of disasters (6 Hrs)

1. Initial Rapid Assessment (IRA)
2. Impact assessment framework/process
3. Tools and techniques
4. Case studies and applications

Unit 4: Risks and needs assessment of the communities and areas affected, and prone to disasters (6 Hrs)

1. Risks and needs of the communities prone to natural disasters
2. Risks and needs of the disaster-affected communities
3. The framework of Post Disaster Needs Assessment (PDNA) in Nepal
4. Cascading disasters

Unit 5: Handling and managing emergencies (6 Hrs)

1. Needs assessment, immediate response, logistics, preparedness for response
2. First responders, rescue and relief, hospital emergency services, first aid, stockpiling,
3. Site selection, planning, and temporary shelter
4. Health, food and nutrition, water, sanitation, and environmental services, Social services, and education
5. Cluster Approach to emergency management
6. Role of security agencies in Nepal for immediate rescue and relief

Unit 6: Contingency planning (6 Hrs)

1. Hazard and risk analysis, contingency prioritization
2. Scenario building
3. Preparing a contingency plan for each selected scenario
4. Monitoring and updating the contingencies plan

Unit 7: Planning for recovery and resettlement

(3 Hrs)

1. Disaster planning and recovery issues
2. Response and recovery programs (settlement, infrastructure, services and livelihood, etc.)
3. Institutional framework and networks

Unit 8: Emergency Management in Buddhist Structures:

(9 Hrs)

Emergency evacuation in Buddhist Stupas, challenges, and opportunities, trauma management through Buddhist way of life

Unit 9: Tutorial

(15 Hrs)

Case Study: A hands-on exercise on firefighting, rescue, and first aid.

References:

1. ADPC (2005). Asian Disaster Reduction Center, Kobe, Japan, Total Disaster Risk Management (Good Practices), 2005.
2. Childs, D. R., & Dietrich, S. (2003). Contingency planning and disaster recovery: a small business guide. John Wiley & Sons.
3. Bradshaw, S. (2003). Handbook for estimating the socio-economic and environmental effects of disasters.
4. Gustin, J. F. (2020). Disaster and recovery planning: A guide for facility managers. CRC Press.
5. Shah, H. C. (2006). The last mile: earthquake risk mitigation assistance in developing countries. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 364(1845), 2183-2189.
6. Canton, L. G. (2019). Emergency management: Concepts and strategies for effective programs. John Wiley & Sons.

DREM 514 GIS and Remote Sensing

Year: I/I; Semester: I	
Course Title: GIS and Remote Sensing	Course Code: DREM 514
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to introduce the principles, concepts, and applications of Remote Sensing (RS) and Geographic Information Systems (GIS) and the major applications for disaster monitoring and management.

Course Content

Unit 1: Introduction to GIS (6 Hrs)

1. Overview, Concepts of GIS
2. Purpose and Benefits of GIS
3. Functions of GIS
4. Functional Elements of GIS
5. Scope & Application Areas of GIS
6. Importance of Remote Sensing Data in GIS

Unit 2: Digital Mapping Concept (3 Hrs)

1. Map concept – Map Features, Map elements, Map Layers
2. Map scales and representation
3. Map Projection – coordinate system and projection systems
4. Map Design

Unit 3: Data Structure in GIS (3 Hrs)

1. Introduction
2. Data Models – Raster Data Models, Vector Data Models
3. Database Management System (DBMS)
4. Raster Data Structure
5. Vector Data Structure
6. Data Compression Techniques

Unit 4: Data Acquisition (6 Hrs)

1. Analog to digital conversion
2. Data from Remote Sensing Imagery
3. Global Positioning System (GPS) based data acquisition

Unit 5: Data Manipulation and Analysis (6 Hrs)

1. Data Manipulation Techniques
2. Spatial Analysis Techniques – statistical and geometrical
3. Geo-processing Techniques
4. Model Development

Unit 6: Introduction to RS Digital Image Processing (6 Hrs)

1. Introduction
2. Data Acquisition
3. Visualization of RS Data
4. Image Conversion – NDVI, LSWI

Unit 7: Correction and Calibration of RS Imagery

(6 Hrs)

1. Geometric Correction
2. Radiometric Calibration
3. Atmospheric Calibration

Unit 8: Image Classification

(6 Hrs)

1. Objective of Classification
2. Supervised and Unsupervised Classification
3. Land Cover and Land Use

Unit 9: Application of GIS and RS to Disaster Mitigation

(3 Hrs)

1. Introduction
2. Damage Assessment Methodologies
3. Risk Management Approach

Unit 10: Tutorial

(15Hrs)

Case Study: Mapping of Buddhist stupas located in and around Kathmandu valley to understand their multi-hazard dimensions.

Reference Books:

1. Star, J., & Estes, J. (1990). *Geographic information systems and introduction* (No. 910.285536 S7).
2. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). *Principles of geographical information systems*. Oxford university press.
3. S. Morain and S. L. Baaros (1996), *Raster Imagery in Geographical Information Systems*, ONWARD Press, 1996.

Year I, Semester II

DREM 551 Research Methodology & Quantitative Techniques

Year: I/II Semester: II	
Course Title: Research Methodology & Quantitative Techniques	Course Code: DREM 551
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective: The objective of the course is to make students able to comprehend the fundamentals of research; facilitates student to carry out their research activities independently; and familiarize the students with the participatory approaches and methodology.

Course Content

Unit 1: Introduction to Research Methodology (6 Hrs.)

- Approach to the application of Buddhist knowledge in modern research
- Scientific research and methods
- Research design
- Research question

Unit 2: Methods of research (3 Hrs.)

- Conventional research method
- Historical research method
- Experimental research method
- Survey research method
- Case study research

Unit 3: Task of writing research papers (9 Hrs.)

- Research proposal: meaning and purpose of the research proposal, academic/project/case study proposals, steps for the preparing proposal, framework and arrangement of subheading in research proposal; writing a research proposal for the academic program; common mistakes in proposal writings
- Review of literature and note-taking; methods selecting relevant literature, ways of note-taking and recording; from different sources.
- Research report: introduction, purpose, and different forms of the report; qualities research reports; presentation of preliminary, general, and technical reports; the format of the research report, necessary elements of the research report, precautions for report preparation.
- Thesis/dissertation; introduction, features of the thesis, structure of thesis, steps in thesis writings, documentation of a thesis/dissertation.
- Citation and referencing: different ways of work citation, arranging reference material; bibliography quoting from different sources; different system of citation and referencing: APA, MLA, and iso690 (numerical reference).
- Publication in research journals: introduction and its importance, arrangements of the article; the difference between general and research article
- Preparation of research/project proposal
- Questionnaire designing
- Preparation of observation schedule for field/lab work
- Case analysis/situation analysis
- Survey report preparation/field or lab work report preparation
- Presentation on a related topic (class seminar)
- Analysis of references and citation (books, journals, reports, theses, etc.)

Unit 4: Sampling and sampling distribution (6 Hrs.)

- Introduction and review of sampling: definition, needs, steps; definition of population, sample, sampling unit, sampling frame, sampling error, and non-sampling error; steps in sampling; fundamentals, characteristics, advantage, and disadvantage of sampling.
 - types of sampling; probability (simple, stratified, systematic, cluster and multistage- in brief), the process of selecting random sample; non-probability sampling (convenience, purpose, quota, snowball, self-selecting); advantages and disadvantages (briefly discuss only)
- Size of sample; factor affecting the size of the sample, testing the reliability of sample, methods of estimating sample size, the process of selecting a random sample

Unit 5: Data and techniques of data collection (6 Hrs.)

- Need and nature of data in construction and disaster risk engineering and management, a different form of information, primary and secondary data, cross-section and categorical data, time, series, spatial, and ordered data. Different pandemic and disaster-related data in world history
- Types of data according to measurement scale, qualitative and quantitative data, nominal, ordinal, interval, ratio scale data
- Data collection in engineering, Schedule, questionnaire, interview, focus group discussion, survey and census, observation methods.
- Ethical consideration
- The participatory approach of learning

Unit 6: Descriptive statistics (3 Hrs.)

- Central tendency
- Location measurement (median, quartile, decile, percentile)
- Variability, skewness, kurtosis

Unit 7: Probability and probability distribution (3 Hrs.)

- Terminology and definition of probability,
- Addition, the multiplication theory of probability
- Bayes theorem
- Random variable
- Mathematical expectation
- Binomial poisson and normal distribution

Unit 8: Hypothesis Testing (6 Hrs.)

Basic concepts to the hypothesis testing; Hypotheses testing of Large Sample(Z-test); Test for equality of population means; The t-test; Testing equality of variances of two normal populations; Confidence interval; Chi-square as a test of goodness of fit; Test of independence of attributes and test of population variance; Analysis of Variance: One-way classification and two-way classification

Unit 9: Application of Qualitative Tools (3 Hrs.)

Application of Qualitative Tools in Construction Engineering and Disaster Risk Management Research

Unit 10: Case Study and Tutorials/Practical: (15 Hrs.)

The case study is focused on contemporary and Nepalese contexts and the above course contents. Students are assigned topics of case study and the students should prepare, present, and submit the assignments to the teacher.

References

Relevant books, documents, archives, and journals, etc.

1. Alan Bryman & Emma Bell (2007). Business Research Methods, Oxford University Press, New York, USA.
2. Cooper & Schindler (2004). Business Research Methods, Tata McGraw-Hill Publishing Co., New Delhi, India.
3. Donald Cooper & Pamela Schindler (2006). Business Research Methods (9th edition), TMGH, McGraw Hill, India.
4. Kothari, C.R. (2008). Research Methodology-Methods and Techniques, New Age International Publishers, New Delhi, India.

DREM 552 Flood Engineering and Disaster Management

Year: I/II; Semester: II	
Course Title: Flood Engineering and Disaster Management	Course Code: DREM 552
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to make students familiar with the theory and practices of flood risk management through river training measures, integrated catchment development, and risk reduction measures.

Course Content

Unit 1: Introduction to Integrated Flood Risk Management (6 Hrs)

1. Rivers of Nepal, Classification of River system of Nepal
2. Hydrological Element: Drainage basin, Rainfall-run-off
3. River Hydraulics: Introduction, Water movement
4. Geomorphic Setting and River Morphology: General, meandering, braiding, profile, bank erosion, unsteady phenomena, vertical sorting, bifurcation, and confluence
5. Hydro-meteorological hazards, their formation, and predictability;
6. Flood disaster situation in Asia and Nepal
7. Causes of floods and secondary hazards, Problem of flood control;
8. Environmental Problem and River Training,
9. Integrated approaches for flood risk management

Unit 2: Climate Change and Impending Flood Risk (3 Hrs)

1. Implementing flood risk reduction interventions under challenging circumstances of climate change and changing vulnerabilities
2. Developing climate outlook/scenario and Adaptation to climate change

Unit 3: Flood Risk Assessment and Planning of Flood Risk Mitigation (6 Hrs)

1. Basic principles and aspects of flood risk assessment
2. Process of flood vulnerability and capacities assessment
3. Process of flood risk assessment, community-based flood risk assessment
4. Concept and importance of floodplain management for flood risk mitigation
5. Tools for flood risk management

Unit 4: River Engineering (6 Hrs)

1. Measures for flood management and erosion control: Non-structural measures, Structural measures
2. Prediction of Scour in river Engineering, Prediction of a high flood, Training Structure and Sub Soil Interaction
3. Vegetation: Hydraulic aspect, Use of vegetation, reinforcement of soil
4. Dimension of River Structures: Revetments, Groynes, longitudinal dikes,
5. Risk in the design of bank protection: Common causes of failure, Probability of failure

Unit 5: River Training Works (6 Hrs)

1. Construction Materials
2. Flood Embankment:
3. Bank Revetment:
4. Spurs/Groynes:
5. RCC Porcupines- Screens/ Spurs/ Dampeners:
6. Drainage Improvement Works:
7. Cross drainage works

Unit 6: Flood Recovery Planning & Implementation (6 Hrs)

1. Concepts of flood recovery planning & implementation
2. Flood damage and need assessment
3. Guidelines for sustainable recovery programs

Unit 7: Cross Cutting Areas (6 Hrs)

1. Economics of flood risk management
2. Financial tools for flood risk reduction
3. Relevant issues on transboundary, governance, and gender

Unit 8: Buddhist structures and their functionality during flooding. (6 Hrs)

Unit 9: Tutorial / Practical: (15 Hrs)

Case Study: A short visit to flood-prone settlement areas in Kathmandu valley, writing a short field visit report suggesting flood risk management solutions for those risky settlements.

References

1. Fleming, G.(2002). How can we learn to live with rivers? The findings of the Institution of Civil Engineers Presidential Commission on flood-risk management. *Philosophical Transactions of the Royal Society of London. Series A: Mathematical, Physical and Engineering Sciences*, 360(1796), pp.1527-1530.
2. Pender, G.(2006). March. Briefing: Introducing the flood risk management research consortium. In *Proceedings of the Institution of Civil Engineers-Water Management* (Vol. 159, No. 1, pp. 3-8). Thomas Telford Ltd.
3. Blazejewski, R., Pilarczyk, K. W., & Przedwojski, B. (1995). *River training techniques: fundamentals, design and applications*. CRC Press.
4. Sayers, P., Yuanyuan, L., Galloway, G., Penning-Rowsell, E., Fuxin, S., Kang, W., & Le Quesne, T. (2013). *Flood risk management: a strategic approach*.
5. Chaturvedi, M. C. (1987). *Water resources systems planning and management*. Tata McGraw-Hill Publishing Company.

ELECTIVE I

DREM 553 Community Based Disaster Risk Management (Elective I)

Year: I/II; Semester: II	
Community Based Disaster Risk Management	Course Code: DREM 553
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objectives:

The objective of this course is to make students familiar with community-based disaster risk management in Nepal.

Course Content

Unit 1: CBDRR Background and Framework (9 Hrs)

- Terminologies related to Community-Based Disaster Risk Management (CBDREM)
- Historical Perspective on Disaster Risk Reduction
- Risks and Trends: Disasters in Nepal and South Asia
- Linking DRR with Development
- DREM Models (Pressure and Release Model, Access Model) and approaches Relevant to CBDRR
- CBDRR Features, Elements, Processes, and Outcomes

Unit 2: Participatory Approaches to Disaster Risk Assessment and DRR Planning (9 Hrs)

- **Disaster Risk Assessment at the Community Level**
Introduction to participatory community disaster risk assessment, hazard assessment, capacity and vulnerability assessment, analysis of stakeholders and resources
- **DRR Planning and Preparedness at Community Level**
Community training on participatory community risk reduction plan, building and sustaining a community DRR organization, partnership for community risk reduction, mobilizing resources for CBDRR Planning and Implementation and participatory monitoring and evaluation for CBDRR, etc

Unit 3: Community Risk Reduction Strategies (9 Hrs)

- Disaster Risk Reduction (DRR) measures and overview
- Implementing CBDRR Action Plans at the community level
- Community Early Warning System (EWS)
- Mitigating geological and hydro-meteorological hazards through community action
- Strengthening livelihoods through disaster resilience
- CBDRR in Recovery – opportunity to build back better and more sustainable DRR organizations
- Child-focused DRR and School-Based DRR
- Public Awareness, Disaster Risk Communication and Advocacy for CBDRR
- Risk transfer and insurance for the poor and vulnerable people

Unit 4: CBDRR Programme Implementation: Challenges and Solutions (9 Hrs)

- Sustaining CBDRR in at-risk communities-nationwide
- Implementing CBDRR in conflict areas and during complex emergencies
- Linking CBDRR in national and local government programs for disaster management and development
- Mainstreaming CBDRR into community development work
- Linking CBDRR to community-based approaches for sustainable livelihoods. natural resource management, environmental protection, and wetland and dry-land Management

Unit 5: Buddhist Perspective to a community-based approach to disaster risk reduction (9 Hrs)

Unit 6: Tutorial/Practical (15 Hrs)

Case Study: Study on monsoon disasters in Nepal (Flood, landslide, thunderbolt) with special focus on CBDRR approaches

Reference Books:

1. Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2005). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.
2. Maskrey, A. (2011). Revisiting community-based disaster risk management. *Environmental Hazards*, 10(1), 42-52.
3. Thapa, Narbikram (2019). Disaster Risk Management. Kathmandu: Jana Bikash Pvt. Ltd.
4. Twigg, J. (2007). *Characteristics of a disaster-resilient community: A guidance note*. Department for International Development (DFID).
5. Victoria, L. P. (2003). Community-based disaster management in the Philippines: Making a difference in people's lives. *Philippine Sociological Review*, 51, 65-80.

DREM 554 Human Resources Management (Elective I)

Year: I/II; Semester: II	
Course Title: Human Resources Management	Course Code: DREM 554
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objectives

To introduce the basic concept of human resources management

To enable the students to apply the principles and practices of organizational behavior and human resource management in the work situation.

To develop skills to handle tactfully emerging human resources challenges and issues.

Course Content

Unit 1: Evolution of Management Thought (3 Hrs.)

Scientific management theory, administrative management theory, Bureaucratic Theory, Behavioral Management, management science theory, organizational environment theory.

Unit 2: Principles and Types of Organization (3 Hrs.)

Need of an organization, formal and informal organizational structures,

Principles (objectives, specialization, coordination, authority, responsibility, delegation, efficiency, control, balance, simplicity, flexibility),

Types (line and staff, functional, matrix, networking, virtual, organic, and boundary-less)

Unit 3: Introduction of Human Resources Management (6 Hrs.)

Meaning and functions of human resource management,

Human resource planning,

Meaning, process and methods recruitment, and selection of employees,

The selection process, selection test, interview, and socialization

Training and development of employees

Determination of training Need

Methods of training

Management development

Unit 4: Job Design and Job Analysis (6 Hrs.)

Meaning of job, task position, and occupation.

Concept, benefits, and methods of job design.

Concept and purpose of job analysis, collecting job analysis information, job analysis techniques- job- focused and person/ behavior focused, job description, job specification, and job evaluation.

Unit 5: Motivation and Leadership: (6 Hrs.)

Motivation:

Meaning and process of motivation,

Major theories of motivation; need-based (Maslow's Hierarchy of Needs, Aldermen's ERG Theory, - Herzberg's Two Factor Theory, McClelland's Learned Needs Theory), Cognitive theory (Expectancy Theory, - Equity Theory/ Social Comparison, Goal Setting Theory), reinforcement theory,

Leadership:

Meaning and need of leadership,

Qualities of leadership

Leadership theories (traits theory, behavioral theory, contingency theory, transformation leadership, servant leadership, emotional intelligence, complexity, and chaos)

Unit 6: Communication:

(3 Hrs.)

Meaning of communication, communication process,
Types (formal and informal)
Barriers to communication, organizational communication and the grapevine, rumors,
Communication with style (noble, Socratic, reflective) effective communication, improving the
communication process, communication breakdown.

Unit 7: Group dynamics, team building, and conflict management:

(6 Hrs.)

Types of groups in an organization, Group behavior,
Group influences, Organization's influence on group behavior,
Teams in an organization: the trouble with teams, high-performing teams, and effective teams.
The team-building approach: when it is needed, aspects of team-building efforts. Improving ongoing
work teams.
Building new teams, Conflict within the teams.
Conflict in an organization, managing conflict.
Methods for resolving conflict.
Stress management.

Unit 8: Decision Making

(3 hrs.)

Management and decision making,
The process of decision making,
Organizational framework for decision making,
Factors influencing decision making,
Decision-making styles of managers and implementation of decisions.

Unit 9: Employee Performance Evaluation and Reward Management

(3 Hrs.)

Meaning of employee performance,
Methods performance evaluation,
Linking performance with a reward system,
Types of reward (financial; direct and indirect, and non-financial: job-related and environment-
related)

Unit 10: Industrial Relations Management

(3 Hrs.)

Meaning and importance of industrial relation,
Parties involved in industrial relations, trade unions, composition and functions, grievance handling
practices and
Provisions, review of labor laws of Nepal

Unit 11: Productivity Management

(3 Hrs.)

Introduction, methods of measuring productivity,
Methods of improving productivity, (managing technology, business process reengineering, training,
and development, benchmarking,)

Unit 12: Case Study and Tutorial/Practical

(15 Hrs.)

The case study is focused on contemporary and Nepalese contexts and the above course contents.
Students are assigned topics of case study, and the students prepare, present, and submit assignments
to the teacher.

References:

Relevant books, documents, archives, and journals, etc.
Labor Act and laws of Nepal
Related Legislations and ILO Convention Papers.
Trade Union Acts and laws of Nepal

1. DeCenzo, D. A. & Robbins, S.P. (2010) *Human Resource Management*, 10th edition, Wiley,
New Jersey, USA.

2. Dressler, G., (2009) *Human Resource Management*. 13th edition, Pearson, New Delhi, India.
3. Luthans, F. (2011) *Organizational Behavior* 12th edition, McGraw-Hill, Boston, USA.
4. Robbins, S.P., & Judge, T.A., (2012) *Organizational Behavior*, 15th. Ed., Prentice Hall of India, Delhi, India.
5. S. K Kharel, (2012) *Foundation of Human Resource Management* Seventh Edition, Kathmandu, Nepal.
6. Schermerhorn, J.R. (2013) *Management*, 12th ed, John Wiley & Sons, USA.

DREM 555 Disaster Prevention, Mitigation, and Preparedness (Elective I)

Year: I/II; Semester: II	
Course Title: Disaster Prevention, Mitigation, and Preparedness	Course Code: DREM 555
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to make students familiar with state-of-the-art concepts and tools on disaster prevention and mitigation aspects with reference to Nepal.

Unit 1: Introduction to the concept of disaster prevention and mitigation (6 Hrs)

(Principle of disaster prevention and mitigation, Importance of disaster prevention, mitigation and preparedness in disaster risk reduction and management cycle, existing national and international framework supporting prevention and mitigation)

Unit 2: Structural and non-structural measures of mitigation (9 Hrs)

- Structural measures of mitigation (engineering structures)
- Non-structural measures of mitigation (Legal Framework, Incentives, Training and Education, Public Awareness, Institutional Building, Warning Systems, etc.)

Unit 3: Evolving concepts on disaster prevention and mitigation (6 Hrs)

Impact based disaster planning, forecast based disaster planning, use of cutting edge tools for disaster prevention and mitigation

Unit 4: Prevention mitigation and preparedness measures for natural disasters (9 Hrs)

- Prevention, mitigation, and preparedness measures for hydro-meteorological disasters
- Prevention, mitigation, and preparedness measures for geophysical disasters
- Prevention, mitigation, and preparedness measures for biological disasters

Unit 5: Cutting edge technology and tools for prevention, mitigation, and preparedness (6 Hrs)

- Information management systems, Space-based technologies, cutting edge technology (blockchain, artificial intelligence), emerging technologies

Unit 6: Buddhist Perspective to disaster prevention, mitigation, and preparedness (9 Hrs)

- The interconnectedness between individuals, society, and nature, disaster risk reduction through the theory of interconnectedness.

Unit 7: Tutorial (15Hrs)

Case Study:

Using digital information management systems for prevention and mitigation (Such as Desinventar, global Flood Awareness System (GLOFAS), U.S. Geological Survey (USGS), Building Information Platform Against Disaster (BIPAD) by NDRRMA)

References:

1. Shaw, R., & Krishnamurthy, R. R. (Eds.). (2009). *Disaster Management: Global challenges and local solutions*. Universities Press.
2. Carter, W. N. (2008). *Disaster management: A disaster manager's handbook*.

3. Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2005). *At risk: natural hazards, people's vulnerability and disasters*. Routledge

Useful Links:

- <https://bipadportal.gov.np/>
- <https://www.globalfloods.eu/>
- <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>
- <https://www.usgs.gov/>

ELECTIVE II

DREM 557 Safety Engineering and Management (Elective II)

Year: I/I; Semester: I	
Safety Engineering and Management	Course Code: DREM 557
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objectives

After completing this course students will be able to identify problems and issues related to safety at the construction site. Students will be able to independently manage safety at the construction site.

Course Content

Unit 1: Introduction (3 Hrs.)

Construction industry and safety, Meaning and scope of construction safety, construction safety in the aspect of Buddhism, Scope for improvement.

Unit 2: Modern Safety Concept: (3 Hrs.)

Introduction; The British Safety Legislation; Growth of safety laws and legislation; Legislation, penalties or standards; concern over health and safety of workers; Concern for general people and property; Educating the mass.

Unit 3: Accidents and Their Causes: (3 Hrs.)

Software causes; Hardware causes; Accidents at construction sites; Losses due to accidents, Calculation of lost hours and lost resources. Theory of Accident in brief

Unit 4: Attending the Emergency: (3 Hrs.)

Introduction; Fire emergency; Drowning, Electric shock; burn with acids and chemicals; Attending a person falling from height; First aid at a construction site; the first aid center.

Unit 5: Prevention of Accidents: (6 Hrs.)

Introduction; Role of legislation; Implementation of safety plan at a construction site; Awareness and self-discipline – discipline at work; Design provisions for reducing accidents; Eliminating the accidents at construction sites.

Unit 6: Documentation for Safety Management: (6 Hrs.)

Preparation of an EHS plan; Organization safety policy- its content; Review of contractor's safety policy; Approval of contractor's EHS plan; Fire safety plan; Emergency dealing plan; Site security plan; Machine inspection records; Daily observation records; Meeting minutes; Test certificates, Manufacturer's instruction manual for storage and handling of hazardous substances; Site activity records.

Unit 7: Work Place Safety Management: (9 Hrs.)

Safety signal and signage; Awareness generating slogans; Equipment safety- third party inspection, licensed operator, training of operator; Ensuring electrical safety; Housekeeping; Training of workers – Induction, toolbox talk, skill training, periodical safety briefing; safety walk down at site; Safety meetings; Safety reporting; Method statement and job Safety analysis (JSA); Near miss reporting; Accidents reporting; Report of property loss; Safety performance chart. Safety supervision – qualification and competence of safety personnel, the role of safety engineers and safety stewards.

Unit 8: Motivation for Safety

(3 Hrs.)

Introduction; motivating the workers; Motivating the supervisors and managers; Motivating the planners and designers; motivating the contractors; the safety committee.

Unit 9: Safety Cost

(3 Hrs.)

Introduction; Cost to the contractor; Cost to the employer; cost of managing safety at a construction site; Calculating the cost of safety; Provision in the tender document.

Unit 10: Safety Practices in Buddhist Heritage

(6 Hrs.)

Safety practices in ancient and modern Buddhist Heritage sites in construction and maintenance

Unit 10: Case Study and Tutorial/Practical

(15 Hrs.)

The case study is focused on contemporary and Nepalese contexts and the above course contents. Students are assigned topics of case study, and the students prepare, present, and submit assignments to the teacher.

References:

Relevant books, documents, archives, and journals, etc.

1. Adhikari, R. P. (1996). HEALTH AND SAFETY IN CONSTRUCTION IN NEPAL. Concrete Technology, 115, Nepal.
2. Atev (1997) S. S. Construction Technology, Mir Publishers, Moscow.
3. Grimaldi, J.V. Simonds, R. H. & Richard, D. (1989), Safety Management, Homewood, IL Irwin.
4. NICMAR (1988), Safety Management in the Construction Industry, NICMAR publication, Bombay.
5. Tarafdar, N. K. & Tarafdar, K. J. (1988), Industrial Safety Management, Dhanpat Rai & Co., Delhi, India.

DREM 558 Advanced Project Management (Elective II)

Year: I/I; Semester: I	
Course Title: Advanced Project Management	Course Code: DREM 558
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course objectives:

The objective of this course is to enable the students to state and explain the concepts of project management in a simple and effective manner with the concept of modern trends and techniques of project management.

Course Content

Unit 1: Project Management Concept (6 Hrs.)

Project and Project Management, Project Characteristics and classification Project, Project Life Cycle, Stage of Construction Project, Basic Principles of Construction Management, Project Environment Concept, Elements of Project Management and Functions, Project Identification, Techniques for Project Management, and Roles of Project Manager.

(6 Hrs.)

Unit 2: Project Appraisal and Techniques of Project Formulation

Concept of project appraisal, tools of project appraisal, project proposal (technical and financial), a procedure for developing a project proposal, techniques of project formulation (feasibility analysis, network analysis, cost-benefit analysis, input analysis, environmental analysis), the concept of logical frame work.

(9 Hrs.)

Unit 3: Project Planning and Scheduling

Concept of project planning and its importance, project planning process, work breakdown structure, project scheduling, and tools used in scheduling (Bar chart, Network analysis: CPM, PERT).

Unit 4: Introduction of Contract Management

(6 Hrs.)

Concept of contract, sub-contract, types of contract, contract planning, Introduction to national and international bidding, contract document and factors to be considered in preparing a contract, EPC Contract, FIDIC Conditions of Contracts.

Unit 5: Project Risk Management

(6 Hrs.)

Introduction to project risk, types of project risk, analysis of the major source of risk, effective management of project risks.

(9 Hrs.)

Unit 6: Project Implementation, Controlling, and Evaluation

Introduction to monitoring, evaluation and controlling Project Control System, Project Control Cycle, Elements of Project Control (Time, Cost and Quality), Variations in Contract, Concept of Earned Value Analysis and S-curve, Decision Support System, Introduction to Project Management Information System (PMIS), Monitoring and Evaluation Framework.

(3 Hrs.)

Unit 7: Introduction to Project Finance

Concept of project finance, features of project finance, project development, and management, project finance and privatization, Form of Project Finance (BOOT, BOT, BTO, BOO BOOT, BOT, BTO, BOO), public-private partnership.

Unit 8: Case Study and Tutorials/Practical

(15 Hrs.)

The case study is focused on contemporary and Nepalese contexts and the above course contents. Students are assigned topics of case study, and the students prepare, present, and submit assignments to the teacher.

References:

Relevant books, documents, archives, and journals, etc.

A Guide to the Project Management Body of Knowledge, Second Edition.

1. Agrawal, G. R. (2013), Project Management in Nepal, MK Publishers and Distributors, Kathmandu.
2. BIS, (2009), Construction Project Management-Guidelines.Part I: General Bureau of Indian Standard, New Delhi 110002, India.
4. BIS, (2013), IS 15883-2: Construction Project Management-Guidelines, Part-2: Time Management Including Safety in Construction, Bureau of Indian Standards, New Delhi 110002, India.
5. Dhurba P. Rizal (2001), Project Management, Ratna pustak bhandar, First Edition, Nepal
6. E.R. Yescombe (2002), Principles of Project Finance, Yescombe-Consulting Limited, London, UK.
7. Frederick E. Gould, PE, CPC (2002), Managing the construction process. Prentice-Hall Upper Saddle River, Second Edition, New Jersey, USA.
8. Ishwar Adhikari and Santosh Kr. Shrestha (2011), A text of Project Engineering, Chandeshwori Publication, First Edition, Nepal.
9. Kuzher, H. (2002), Project management, CBS publishers and distributors, New Delhi, India.

DREM 559 Landslide Risk Management (Elective II)

Year: I/II; Semester: II	
Course Title: Landslide Risk Management	Course Code: DREM 559
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to make students familiar with the theory and practices of landslide risk management with reference to Nepal.

Course Content

Unit 1: Introduction to Landslide hazard (6 Hrs)

Landslide definitions, classification, types of landslide, landslide mechanism, the morphology of landslide, parts of landslides – description of features, factors responsible for landslides, potential landslide risk indicators, Impact of landslide disasters, effects and consequences of landslides, inter-relationship of landslides with other natural hazards, multiple hazard effect, communicating landslide hazard, landslide warning signs, minimizing the effects of landslides, landslide scenario in Nepal, landslide disasters and management practices in Nepal.

Unit 2: Landslide Inventory Mapping and Hazard Zonation (6 Hrs)

Basic definition, the procedure of landslide inventory mapping, the scope of landslide inventory mapping, landslide database, landslide hazard zonation mapping, selection of scales, hazard zonation of rainfall, and earthquake-induced landslides, measures to reduce landslides hazards and/or risks, limitations, and qualifications of landslides assessment.

Unit 3: Landslide Risk Assessment and Vulnerability Analysis (9 Hrs)

Introduction, Principles of landslide risk assessment, risk assessment framework and process, a component of vulnerability mapping, landslide vulnerability mapping and analysis, Community based landslide risk assessment and Vulnerability analysis, hazard identification and mapping, exposure analysis, etc.

Unit 4: Landslide Investigation and Mitigation (9 Hrs)

Investigation of Landslides, preparing a Detailed Investigation Plan, Geological Investigations, Geotechnical Investigations, Landslide Remediation Practices, Mass Improvement Techniques, Mitigations Methods for Various Types of Landslide Hazards, Slope Stabilization using Vegetation, Mulching, Biotechnical Slope Protection, Landslide Dam Mitigation, Construction of an Erosion, Resistant Spillway, Drainage Tunnel through an Abutment.

Unit 5: Landslide Instrumentation, Monitoring, and Early Warning (6 Hrs)

Slope Instrumentation, Monitoring, and Landslide Prediction, Early Warning of Landslides, Monitoring of Landslides, Surface Measurements of Landslide Activity, Subsurface Measurements of Landslide Activity, Total Regime Measurements, Real-time Automated Monitoring of Landslide, Investigation of Surface Deformation, Investigation of Geologic Structure, Evaluation of Slide Plane / Monitoring of Sub-20 surface Movements, Groundwater Investigation, Geotechnical Investigations (Soil and Rock Mechanic Tests), Early Warning Systems for Landslides, Dissemination, and Communication.

Unit 6: Buddhist perspective to the plantation for slope protection (9 Hrs)

Tree species associated with Buddha's life, Buddhist philosophy on soil & water conservation

Unit 7: Tutorial (15Hrs)

Case Study: Hands-on exercise on understanding landslide hazard maps, susceptibility maps, and landslide risk maps using national disaster information management system. (<https://bipadportal.gov.np/risk-info/#/hazard>)

Reference Books

1. Crozier, M. J., & Glade, T. (2005). Landslide hazard and risk: issues, concepts, and approach. *Landslide hazard and risk*, 1-40.
2. Fell, R., & Hartford, D. (2018). Landslide risk management. In *Landslide risk assessment* (pp. 51-109). Routledge.
3. Hungr, O., Fell, R., Couture, R., & Eberhardt, E. (Eds.). (2005). *Landslide risk management*. CRC Press.
4. Kangas, P. (Ed.). (2003). *Ecological engineering: principles and practice*. CRC Press.

Year II, Semester III

DREM 611 Project Work on Disaster Management

Year: II/I; Semester: III	
Course Title: Project Work on Disaster Management	Course Code: DREM 611
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course is to build the practical knowledge and skills of the students on an independent study of specimen projects and presentation of the research in an academic approach.

The Project work

The project research area broadly covers disaster planning and management planning such as on Cultural heritages (e.g. Lumbini, Swayambu, etc.).

The project work is to help students in studying Disaster management; Disaster Rescue processes, and Techniques.

A group(s) of students shall be formed by the college or individual, assigned project work should be carried out by each group or individual. The work should be presented and evaluation will be made by the supervisor(s).

Students shall follow the project work guideline and prepare a report of a high standard and the report synopsis should be acceptable to the college.

The evaluation of this course will be only internal.

Reference: Latest research papers

ELECTIVE III

DREM 612 Environmental Management (Elective III)

Year: II/I; Semester: III	
Course Title : Environmental Management	Course Code : DREM 612
Nature of the Course : Theory + Tutorial	Per week Hours: (3+1)
Credit : 4	Total Hours : 60

Course Objective:

The course aims to make students familiar with environment management with reference to Nepal.

Course Content

Unit 1: Introduction (6 Hrs)

- Key Terminologies, Basic Concepts, Environmental Pollutants, Exposure and Human Health Risks, Environmental Standards, Monitoring, and Modeling, Pollution Management, Waste Management, Emerging Environmental Issues
- Introduction to climate Change, international and national framework on climate change

Unit 2: Environment Assessment (6 Hrs)

- Definition of Environmental Impact Assessment, importance and its scope in Humanitarian and Development project execution
- Concept of Sustainable Development and its relationship with environmental management with special reference to Nepal
- Disasters in the light of sustainable development
- History of EIA (before 1970 and after)
- Strategic Environmental Assessment

Unit 3: Impacts and structure of Environment Impact Assessment (EIA) (9 Hrs)

- Principles guiding EIA for disasters
- Impact classification and disaster variation
- Nepal Environmental Act 2076 and By-Laws
- Direct, Indirect and Cumulative impacts (Cumulative Impact Assessment as a new tool for Disaster Management)
- Main features and stages of EIA process

Unit 4: Logistics of EIA (6 Hrs)

- Integration of EIA into the development project cycle
- Financial aspects, Institutionalization of EIA and its integration into laws and policies

Unit 5: Rapid Approaches to EIA (9 Hrs)

- Screening and Scoping (Initial Environmental Evaluation, full-scale EIA)
- Rapid Environmental Assessment (REA)
- Preparation of Terms of Reference to conduct EIA for Humanitarian and Development Projects

Unit 6: Environmental Ethics in Buddhism (9 Hrs)

Unit 7: Tutorial (15 Hrs)

Case Study:

- Hands-on Exercise on Environment Impact Assessment Methodologies
- Environmental Risk Assessment for disaster situations, etc.
- EIA report outline

References:

1. Asante-Duah, K. (2019). *Management of contaminated site problems*. CRC Press.
2. Barrow, C. J. (1999). *Environmental management: principles and practice*. Psychology Press.
3. Madu, C. N. (2007). *Environmental planning and management*. World Scientific.
4. Ricci, P. (2006). *Environmental and health risk assessment and management: principles and practices* (Vol. 9). Springer Science & Business Media.
5. Thapa, Narbikram. (2018). *Updated Manual of Environmental Management*. Lalitpur: Lumbini International Academy of Science and Technology.

DREM 613 Climate Change Adaptation and Mitigation (Elective III)

Year: II/I; Semester: III	
Course Title: Climate Change Adaptation and Mitigation	Course Code: DREM 613
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective: The course aims to make students familiar with the climate change adaptation and mitigation aspects with reference to Nepal and the global level.

Course Content

Unit 1: Key Terminologies, Climate Change Science and Impacts (9 Hrs)

- **Key Terminologies:** Impacts, vulnerability, adaptation, mal-adaptation, coping, resilience, mitigation, risk, hazards, shock, variability, trend, exposure, sensitivity, adaptive capacity
- **Climate Change Scenarios:** Changes in temperature (changes in land surface temperature, changes in sea surface temperature), Variation in rainfall, Ice melting, and sea-level rise
- **Impact of Climate Change:** Climate change impacts different sectors such as Agriculture, Forest, Infrastructure, Water Resources, etc.
- **Key Response Measures** to deal with climate change i.e. mitigation and adaptation, etc.
- **International debate and negotiations on climate change,** climate change as a political and economic issue

Unit 2: Vulnerability to Climate Change, Linkage between Climate Change and Disaster (12 Hrs)

- Key concepts, vulnerability to natural, physical and social systems, differential vulnerability
- Extreme climatic events, such as drought, flood, GLOF, typhoon, cyclone, etc.
- Analysis of intensity and frequency of those events depending on the temporal dimension
- Vulnerability of the community to those events

Unit 3: Adaptation to Climate Change (6 Hrs)

- Adaptation science, types of adaptation, context-specific adaptation, etc.
- The link between adaptation and development, where commonalities and differences exist

Unit 4: International and National Framework on Climate change (9 Hrs)

- Paris Agreement on Climate Change
- United Nations Framework on Climate Change, Conference of Parties
- National Climate Change Policy, 2018
- Local Adaptation Plan of Action, National Adaptation Plan of Action (LAPA, NAPA)
- Nationally Determined Contributions
- Institutional Arrangements for Climate Change in Nepal

Unit 5: Buddhist philosophy on tackling climate crisis (9 Hrs)

Unit 6: Tutorial (15 Hrs)

Case Study: These hands-on exercises will help the students to understand the role of media in shaping the perception of climate risks. This assignment includes the collection of newspaper articles on climate change, making an analysis on the role of media, and writing a reflective paper.

References

1. Bajracharya, B., Shrestha, A.B. & Rajbhandari, L. (2007). Glacial Lake Outburst Floods in the Sagarmatha Region. Hazard Assessment Using GIS and Hydrodynamic Modeling. Mountain Research and Development.
2. Beniston, M., Diaz, H.F. & Bradley, S. (1997). Climatic change at High Elevation Sites: An overview. Climatic change.
3. CBS (2006). Environmental Statistics of Nepal. Kathmandu, Nepal.
4. Chaudhary and Aryal. (2009). Global Warming in Nepal: Challenges and Policy Imperatives, Journal of Forest and Livelihood, Vol.8, February 2009, Kathmandu, Nepal.
5. Nepal Climate Change Policy
6. UN framework on Climate Change

DREM 614 Urban Disaster Risk Management (Elective III)

Year: II/I; Semester: III	
Course Title: Urban Disaster Risk Management	Course Code: DREM 614
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective: The course aims to make students familiar with urban disaster risk management with reference to Nepal.

Course Content

Unit 1: Introduction to Urban Systems (9 Hrs)

Urbanization, Urban elements, Urban disasters, urban infrastructures, Urban Population, Trends of urban expansion, Urban-rural linkages in Nepal, Elements of urban systems, Income opportunities versus risks, Urban Economy; Buddhist landscapes in Nepal Mandala

Unit 2: Urban risk assessment (9 Hrs)

Urban risk mapping, urban risk assessment, vulnerability assessment, and risk mapping, etc.

Unit 3: Risk sensitive land use Planning (9 Hrs)

Policies and Practice, national and sub-national urban planning processes, opportunities, incentives, and challenges to risk-sensitive land use planning, National Urban Development Strategies (NUDS), etc.

Unit 4: Urban environment and risk management (12 Hrs)

- Water, Sanitation, and hygiene (WASH) and related infrastructures in urban areas, Sewage and Sewerage System, Solid Waste Management, Urban Flooding, High rise building and their seismic performance, Air pollution, Vehicles, and Traffic management, Urban Opportunities versus Urban Risks, Slum areas in major urban centers
- Industrial disasters,
- DRR inclusive Infrastructures, Urban policies, Urban governance, risk insurance, open spaces, pollution management, prevention of accidents, safety and security of vulnerable groups
- The resilience of cities: the international framework (e.g. UNDRR), national context

Unit 5: Buddhist Urban landscape and risk management (3 Hrs)

- open space, neighborhood, basic facilities (water supply, drainage)

Unit 5: Tutorial (15 Hrs)

Case study: Detail assessment of urban risks in two Buddhist stupas of Kathmandu valley (Swayombhunath and Boudhanath)

References:

1. Capola, D.(2006). Introduction to International Disaster Management, Elsevier
2. Cheng F. Y.(1995)Urban disaster mitigation: the role of engineering and technology, Elsevier
3. Un-Habitat. (2012). *Enhancing urban safety and security: Global report on human settlements 2007*. Routledge.
4. Kreimer, A. Arnold, M. & Carlin, A (2003). Building Safer Cities: The Future of Disaster Risk, The World Bank
5. Özerdem, A. Jacoby, Tauris, J. B.(2006) Disaster management and civil society: earthquake relief in Japan, Turkey, and India

6. Shaw, R. Srinivas, H. & Sharma, A.(2009). Urban Risk Reduction: An Asian Perspective, Emerald Group Publishing
7. Yozo, F. & Takafumi F.(2009) Stock Management for Sustainable Urban Regeneration (cSUR-UT Series: Library for Sustainable Urban Regeneration), Springer

DREM 615 Bioengineering (Elective III)

Year: II/I; Semester: III	
Course Title : Bioengineering	Course Code : DREM 615
Nature of the Course : Theory + Tutorial	Per week Hours: (3+1)
Credit : 4	Total Hours : 60

Course Objective:

The course aims to make students familiar with bioengineering techniques with reference to Nepal.

Course Content

Unit 1: Introduction (6 Hrs)

Definition, problems on a slope, engineering and hydrological functions, scope and benefits of bioengineering, limitations of bioengineering

Unit 2: Site Investigation (9 Hrs)

- Analysis of slope stability on the basis of rock fractures, rock types, grade of rocks
- Mass movements and its classification
- Causes and mechanism of slope failure
- Landslide and gulley mapping

Unit 3: Basic Aspects of Vegetation (6 Hrs)

- Vegetation and plant types
- The basic requirement of plants
- Plant propagation
- Ecology of Nepal and plant selection
- Selection of plant types based on drought factors

Unit 4: Roles of Vegetation in slope stabilization (6 Hrs)

- Engineering, hydrological and mechanical roles
- Soil strength and stability analysis (numerical)

Unit 5: Structures (6 Hrs)

- Seed, Seedling, Grass Plantation and Types
- Brush Layering, palisades, fascines, turfing installation process, functions, applications, and limitations
- Selection, design, and application of small scale civil engineering structures
- Interaction between vegetative and civil structures

Unit 6: Nursery and its management: Establishment of a nursery, nursery techniques (9 Hrs)

Unit 7: Buddhism discourse in bioengineering and slope protection (3 Hrs)

Unit 8: Tutorial (15Hrs)

Case Study:

- Bamboo plantation, life cycle, cost, and benefits analysis for slope protection
- Amliso plantation, life cycle, cost, and benefits analysis for slope protection

References:

1. Bikash Adhikari, 2021, "A manual on stabilization of shallow seated instability", Nepal.
2. Dahal R. K., 2006, "Geology for Technical Students - A textbook for Bachelor Level Students", Bhrikuti Academic Publication, Exhibition Road, Kathmandu, Nepal.
3. John Howell, 2002, "A handbook on roadside bioengineering", department of Road, Government of Nepal, Nepal.

ELECTIVE IV

DREM 616 Disaster Response, Recovery, Rehabilitation and Reconstruction (Elective IV)

Year: II/I; Semester: III	
Course Title: Disaster Response, Recovery, Rehabilitation and Reconstruction	Course Code : DREM 616
Nature of the Course : Theory + Tutorial	Per week Hours: (3+1)
Credit : 4	Total Hours : 60

Course Objective:

The course aims to make students familiar with the disaster recovery, rehabilitation, and reconstruction aspects with reference to Nepal.

Course Content

Unit 1: Disaster Response (6 Hrs)

- Legal framework for disaster response in Nepal
- First responders, the role of security agencies and Red Cross
- Cluster Approach
- Role of NGOs and INGOs
- Relief coordination, humanitarian principles, and standards

Unit 2: Disaster Recovery

● **Introduction to Disaster Recovery (6 Hrs)**

The basic concept, early recovery, disaster analysis, transfer of responsibilities from response to recovery, a continuation of response activity, basis for recovery action, problem areas in recovery, Legal framework for disaster recovery in Nepal

● **Major Requirements for Effective Recovery (6 Hrs)**

Understanding Recovery Process, Recovery, and National Development, Recovery Information Base, Information from Response Operations, Post-disaster review, information from development programs, information from special teams, information for program parameters, information from previous disasters, etc.

● **Recovery Strategy, Policy Direction, and Needs (9 Hrs)**

Major areas of recovery need, envisaged time frame for recovery action, interlinking of recovery with national development, the policy direction of recovery program, Gender and Social Inclusion, Recovery Program Needs and Areas: Government aspects, private sector, community, foreign aid

Unit 3: Reconstruction and Rehabilitation (9 Hrs)

Bouncing forward versus bouncing back, reconstruction of structures, risk reduction measures in rehabilitation and reconstruction, sustainable development goals in post-disaster, post-disaster development inclusive of DRR, Foreign aid in post-disaster, disaster as an opportunity, Gender and Social Inclusion, perspectives in reconstruction and rehabilitation, the legal framework of reconstruction and rehabilitation in Nepal

Unit 4: Buddhist approach to disaster recovery, emotional resilience to disasters, compassionate recovery (9 Hrs)

Unit 5: Tutorial

(15Hrs)

Case Study: Reflection on the reconstruction and rehabilitation activities post-Nepal earthquake, 2015, analyzing the work done by National Reconstruction Authority (NRA). A short research paper is expected from this exercise with students having the opportunity to learn report writing skills.

References

1. Carter, W. N. (2008). Disaster management: A disaster manager's handbook.
2. Garnett, J.D. and Moore, M. (2009). Enhancing disaster recovery: Lessons from exemplary international disaster management practices. *Journal of Homeland Security and Emergency Management*, 7(1): 1-22.
3. Phillips B.D. (2009). Disaster Recovery, Chapter 3: Disaster Recovery Planning. Chapter 8 - Business Recovery; Chapter 9 – Infrastructure and Lifelines.
4. Rubin, C.B. (2009). Long-term recovery from disasters-the neglected component of emergency management. *Journal of Homeland Security and Emergency Management*, 6(1): 1-19.

DREM 617 Disaster Risk Management of Cultural Heritages (Elective IV)

Year: I/I; Semester: I	
Course Title: Disaster Risk Management of Cultural Heritages	Course Code: DREM 617
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

To familiarize the student with the fundamentals of disaster risk management of cultural heritage with reference to Nepal.

Course Content

Unit 1: Introduction to heritage (6 Hrs)

- Different types of heritage, national heritages
- Terminology (Conservation, Preservation, Renovation, Reconstruction)
- Archeology, Monument
- Exposure of heritages to different hazards in Nepal, natural and human-induced disasters

Unit 2: Principles of Safeguarding of heritage (3 Hrs)

- Conservation, Preservation, Renovation, and Reconstruction

Unit 3: Vulnerability Assessment of Cultural heritage (3 Hrs)

- Vulnerability framework
- Different methods to assess vulnerability

Unit 4: Risk assessment of Cultural heritage (3 Hrs)

- Qualitative value of risk
- The quantitative value of risk
- Methodologies of risk assessment

Unit 5: Government regulation and Institutional Framework for disaster management and protection of cultural heritages (6 Hrs)

- International framework
- Different Acts, Policies
- Compliance and control for risk mitigation
- Community-based disaster risk management for cultural heritages

Unit 6: Risk management (6 Hrs)

- Risk management tools
- Risk sharing and insurance/ Risk sharing models
- Financing the risk

Unit 7: Indigenous knowledge in disaster risk reduction (6 Hrs)

- Indigenous construction practices
- Cultural and religious aspects of heritage construction
- Historical practices for DRRM in heritages

Unit 8: Post-disaster response, recovery, reconstruction, and rehabilitation (6 Hrs)

- Government agencies, local community, etc.

- Important considerations for the rehabilitation and reconstruction of heritage sites
- Challenges and Benefits

Unit 9: Buddhist heritage site

(6 Hrs)

Detailed analysis of Buddhist heritage sites in the DRRM landscape, structural aspects of construction, cultural aspects, and indigenous techniques

Unit 10: Tutorial / Practical

(15 Hrs)

Case Study: Disaster Resilience through indigenous construction techniques, insights from heritage sights

References:

1. Jigyasu, R., & Arora, V. (2014). Disaster risk management of cultural heritage in urban areas: a training guide: a training guide for conducting courses in disaster risk management for cultural heritage in urban areas.
2. Michael; Will, Thomas (Eds.) (2007). International Council on Monuments and Sites, Nepal (ICOMOS Nepal)
3. UNESCO (1998). International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM); International Council on Monuments and Sites, International Committee on Risk Preparedness (ICOMOS - ICORP); United Nations Educational, Scientific and Cultural Organization
4. UNESCO (2007). Disaster preparedness and mitigation: UNESCO's role United Nations Educational, Scientific and Cultural Organization
5. UNESCO (2010). Managing disaster risks for world heritage International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM); International Council on Monuments and Sites, International Committee on Risk Preparedness (ICOMOS - ICORP); International Union for the Conservation of Nature (IUCN); United Nations Educational, Scientific and Cultural Organization

DREM 618 Disaster Law, Policies, Frameworks, and Strategies (Elective IV)

Year: 1/II; Semester: II	
Course Title: Disaster Law, Policies, Frameworks, and Strategies	Course Code: DREM 618
Nature of the Course: Theory + Tutorial	Per week Hours: (3+1)
Credit: 4	Total Hours: 60

Course Objective:

The course aims to make students familiar with the disaster laws, policies, frameworks, and strategies with reference to Nepal and South Asia.

Course Content

Unit 1: Disaster Policies, Laws, and Legislation in Nepal (9 Hrs)

1. Introduction and History of Disaster Policy, Laws and Legislation in Nepal
2. National Disaster Management Legislation in Nepal
3. Contingency Planning
4. Standard Operating Procedure
5. Local Disaster Risk Management Plan
6. National Disaster Response Framework
7. Disaster Risk Reduction and Management Act 2017
8. National Policy in Disaster Risk Reduction and Management
9. National Strategy on Disaster Risk Reduction

Unit 2: Global and Regional Policies, Frameworks, and Strategies (15 Hrs)

1. Introduction to Global DRR Policy
2. DREM Policies and Strategies of SAARC, ASEAN, EU, etc.
3. DREM Policies and Strategies of United Nations, World Bank, Asian Development Bank, and other Major Donors.
4. Framework and Strategies, Sendai Framework for Disaster Risk Reduction, Paris Agreement on Climate Change
5. Belt and Road Initiative (BRI) of China for Humanitarian and Development of member countries.
6. Indo-pacific Strategy

Unit 3: Mainstreaming DREM into Government Policy, Plan, and Program (12 Hrs)

1. Definition, Scope, and Needs of Mainstreaming
2. Global and Regional Scenario on DREM Mainstreaming
3. National and Local Level Mainstreaming
4. Sectoral Mainstreaming Plans, Policies, Programs, and Guidelines
5. Addressing the transboundary issues in reference to Nepal-India floods
6. Policy Analysis on Disaster Risk Management
7. Disaster Diplomacy, Climate Change and Politics, Climate Change negotiations and diplomacy

Unit 4: Buddhist strategies to disaster risk reduction and management (9 Hrs)

Unit 5: Tutorial (15 Hrs)

Case Study

Stakeholder Mapping: Mapping of institutions and organizations (governmental, non-governmental, UN agencies, donor agencies, academic institutions) working in different sectors of disaster risk reduction and management in Nepal and categorizing them based on their working areas.

Reference Books:

1. Nepal Governments Disaster-related Documents
2. UN, World Bank, ADB, EU, and other related organizations publications
3. Thapa, Narbikram (2019). Disaster Risk Management. Kathmandu: Jana Bikash Pvt. Ltd.

Year II, Semester IV

DREM 651 Thesis Work

Year II	Semester II	Thesis	
Course Code	Title of Course	Credits	Full Marks
DREM 651	Thesis Work (on a relevant topic relevant to disaster risk engineering and management in close coordination with the department and supervisor)	16	400

Evaluation	Score
Thesis Supervisor	240
Coordinator/Research Committee (Average of member(s), such members can be maximum of three)	40
External	120

A thesis guideline shall be provided by the Program of MSc Disaster Risks Engineering and Management following the guidelines of Lumbini Buddhist University, which also consists:

- Framework of a research plan
- Manuscripts standards
- Proposals
- Requirements of publications
- Research works
- Presentations and defense
- Acceptance

References

Relevant books, documents, archives, and journals, etc.

Annex-I Syllabus Revision Process

1. Selecting Experts

Reviewers were selected based on their experiences and contributions in their respective professional fields as well as the academic sector. Upon the recommendations of the senior experts associated with the establishment and management of the ongoing programs, a panel of reviewers was finalized.

2. Collecting Experts View:

All the experts were requested to provide their individual suggestions and feedback in their respective subjects.

3. Incorporating the Experts feedback

Various views, suggestions, and feedbacks were collected, compiled, and incorporated into the contents of the syllabus.

4. Methods of Collecting Feedback

- Direct face to face meeting on a given subject
- Online Meeting (via zoom and telephone)
- Group meeting on common agenda

5. Finalizing the draft report of course revision

The first draft was prepared upon inclusion of individual suggestions and feedback and circulated among the panel of reviewers for their second opinion. Thus, the second draft was prepared.

6. Presentation of the Subjects by the experts

The second draft was presented to a committee of experts as well as university representatives to assure that the draft was in accordance with the requirements of the University Grant Commission, Institute of Engineering, and the Lumbini Buddhist University.

7. Preparation of final draft report

Upon receiving feedback from the respective experts and representatives, the final draft was prepared and submitted to the Office of the Dean of the School of Development Studies & Applied Sciences at Lumbini Buddhist University.

8. Duration

Start Date: 15th February 2021

End Date: 21st November 2021

Acknowledgment

We would like to acknowledge all the experts, especially the individuals mentioned below in the table their contribution during the revision of this course. Substantial feedback and suggestions were also received from the School of Development Studies and Applied Sciences during the entire process of revision.

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References

- GON, 2077. Shiksha Sambandhi Kehi Nepal Ain Sanshodhan Garna Baneko Ain in Nepal Rajpatra (Khanda 70 Atiriktanka 12) 2077 Ashar 11. Kathmandu: Mudran Vibhag (pp 51)
- HEQFDT, 2016. HIGHER EDUCATION QUALIFICATION FRAMEWORK NEPAL. Bhaktapur: Higher Education Qualification Framework Drafting Taskforce (HEQFDT), University Grant Commission, Nepal (p 9)
- LBU, 2019. Minute of the 11th Senate of Lumbini Buddhist University held on 2076 Srawan 29 in Kathmandu under the Chairmanship of Minister for Education, Science & Technology and Co-Chancellor of the University (pp23)
- LBU, 2020. Subject Committee of Buddhist Architecture and Engineering (BAE) - Meeting Notes and Decisions (First Meeting SC/BAE/01 November 22, 2020, Sunday) (pp8)