

UNIVERSITY OF LADAKH
KARGIL CAMPUS



COURSE STRUCTURE
FOR
M.Sc. DISASTER MANAGEMENT
(2023-24)

Programme Outcome:

- M.Sc. Disaster Management program will demonstrate a comprehensive understanding of the fundamental concepts, theories, and principles of disaster management. They will possess specialized knowledge in disaster risk reduction, emergency response, recovery, and resilience.
- Graduates will be able to critically analyse complex disaster management scenarios, identify potential risks, and develop effective strategies for mitigation and response. They will possess the skills to assess the socio-economic, environmental, and technological factors that contribute to disaster vulnerability and formulate evidence-based solutions.
- Students will acquire the skills to develop disaster management plans, conduct risk assessments, and design preparedness measures. They will be able to apply various methodologies and tools to evaluate vulnerabilities, develop early warning systems, and implement strategies to enhance community resilience.
- Students will develop leadership and management skills to effectively coordinate and lead disaster management initiatives. They will understand the roles and responsibilities of various stakeholders, and be capable of working in interdisciplinary teams to address the challenges of disaster management.
- Research and Analysis: Students will be proficient in conducting research, collecting and analyzing data, and interpreting findings related to disaster management. They will have the ability to contribute to the field through original research, evaluate existing practices, and propose innovative solutions to mitigate the impact of disasters.
- Graduates will have a global perspective on disaster management, understanding the interconnectedness of disasters and their impacts across borders. They will be aware of international frameworks, policies, and best practices, and be able to contribute to global efforts in disaster risk reduction and resilience building.
- Graduates will have a commitment to lifelong learning and professional development in the field of disaster management. They will stay updated with the latest developments, emerging technologies, and research advancements to continually enhance their knowledge and skills.
- Graduates will actively engage with local communities, stakeholders, and organizations to promote disaster resilience, raise awareness, and advocate for effective disaster management practices. They will foster partnerships and collaborations to enhance community capacity and ensure sustainable disaster management initiatives.

Course Description:

M.Sc. Disaster Management is a two year course comprising of four semesters with a total of 80 Credits. The students are offered (14) Core Papers along with (08) Discipline Centric Elective Theory Papers, (03) Multidisciplinary Papers, (01) Tour Report and (01) Dissertation/Project Work. Core Papers are generally comprised of 04 credits. Discipline Centric Electives and Multidisciplinary papers comprises of 02 credits respectively, Tour Report of 02 credits and Dissertation/Project Work of 08 credits. The M.Sc. Programme in Disaster Management is based on 80 credits with six different components viz., (I) Teaching (II) Tutorial (III) Practical, (IV) Seminar, (V) Field Studies and (VI) Project Work (Dissertation) in fourth semester. A candidate compulsorily has to obtain 20 credits per semester i.e. 40 credits in one year programme (2 semesters) and a total of 80 credits in two year programme (4 semesters). Out of the 20 credits in a semester; 16 credits compulsorily are to be opted from —Core Courses, while the remaining 04 credits can be obtained in either of the following two ways: 02 credits are to be obtained from Discipline Centric Electives and 02 credits are to be obtained Multidisciplinary papers.

Further, a student under the M.Sc. Disaster Management programme has to compulsorily submit a Tour Report bearing 02 and Dissertation/Project Work of 08 credits by the end of 4th Semester.

Course Structure of M.Sc. Disaster Management (2023 onwards)

1st Semester			
Course Code	Category	Course Title	Course Credits
DM-C-101	Core	Fundamentals; Global and Local Level Initiatives for Disaster management	4
DM-C-102	Core	Understanding Hazards and Earth Surface Processes	4
DM-C-103	Core	Remote Sensing, GIS and GPS	4
DM-EL-104	Elective	Environmental Impact Assessment and Management	2
		Early Warning, Forecasting and communication	
DM-P-105	Core	Lab Course (as per theory)/ Filed work	2
DM-MD-106	MD	National and Regional Hazard Profile	2
DM-MP-107	MP	Minor Project	2
Total Credits			20
2nd Semester			
DM-C-201	Core	Vulnerability Assessment	4
DM-C-202	Core	Disaster Rehabilitation, Reconstruction & Recovery	4
DM-C-203	Core	Geospatial Tools and Risk Sensitive Land Use Planning	4
DM-EL-204	Elective	Introduction to Seismic Risk Reduction	2
		DRR, Adaptation and Resilience	
DM-P-205	Core	Lab Course (as per theory)/ Filed work	2
DM-MD-206	MD	Human Induced Disasters and their management	2
DM-MP-207	MP	Minor Project	2
Total Credits			20
3rd Semester			
DM-C-301	Core	Disaster Mitigation and Preparedness	4
DM-C-302	Core	Disaster Risk Assessment	4
DM-C-303	Core	Economic and Financial Aspects of Disaster	4
DM-P-304	Core	Field Visit to Disaster Prone Areas and Report Writing	4
DM-MD-305	MD	Emergency Response and Crisis Management	2
DM-MP-306	MP	Minor Project	2
Total Credits			20
4th Semester			
DM-C-401	Core	Psychosocial Care in Disaster Management	4
DM-C-402	Core	Climate Change & Community Based Disaster Management	4
DM-EL-403	Elective	Search and Rescue; and Post Disaster Management	2
		Statistical techniques for Disaster Management	
Tour Report			2
Dissertation/Project Report			8
Total Credits			20
Grand Total Credits			80

**MD (Multidisciplinary Course): To be opt by the students of other disciplines.*

1st SEMESTER		
Course Title: Fundamentals; Global and Local Level Initiatives for Disaster management		
Course Code: DM-C-101	Category: Core	Credit: 04

Course Outcome: The course has been designed to promote the understanding of the basic concepts, principles, and significance of disaster management and its evolution with time. The learners are expected to understand the different phases of disaster management cycle right from Rescue, Relief, and Rehabilitation to Mitigation and Preparedness Phases. The learners will also understand the Policies and Principles of disaster management adopted at Local, National and International Levels to mitigate the impacts of disasters for the sustainable development. The course also highlights the Disaster Management Policy of India and its organization at Centre, State and District Levels with reference to Ladakh. The learners will understand why Asia-Pacific is the hub of major disasters followed by African countries, North and South America, European Union and USA in a decreasing order of intensity and will also be made familiar with DRR and mitigation strategies adopted across the globe.

Credit-I

1. Disaster Management- Concept and Evolution
2. Disaster Management- Components and Scope
3. Disaster Management Cycle
4. Paradigm Shift in Disaster Management
5. Disasters and Developmental Interface

Credit-II

1. Disaster Management Policy: Principles and Significance
2. Disaster Management Policy of India
3. Disaster Management Policy of UT Ladakh
4. Institutional Mechanism for Disaster Management for India and Ladakh
5. UN Organizations for Disaster Management- Overview

Credit-III

Disaster Profile Overview of:

1. Asia Pacific Region
2. Africa
3. North and South America
4. European Union
5. South Asia

Credit –IV

1. The International Decade For Natural Disaster Reduction
2. The Yokohama Strategy, The Hyogo Framework for Action
3. The Sendai Framework for Disaster Risk Reduction,
4. International Committee of Red Cross and Red Crescent
5. United Nations Framework Convention on Climate Change

Suggested Readings:

- Disaster Management; G. K. Gosh. A.P.H. Publishers.
- Encyclopaedia of Disaster and Hazards Management; Rajesh K. Yadav et. al. Oxford Book Company
- A Manual on Disaster Management; Parag Diwan, 2010. Pentagon Earth.
- Disaster Science and Management; Tushar Bhattacharya, Mc. Graw Hill
- Introduction to International Disaster Management; Damon Coppola. 3rd Edition, 2015.
- Disaster Theory: An Interdisciplinary Approach to Concepts and Causes; David Etkin, 2014.

- Disaster Risk Management Systems Analysis: A Guide Book. Stephan Baas, 2008. Food and Agriculture Organization of the United Nations.
- Handbook of Hazards and Disaster Risk Reduction; Ben Wisner, J.C. Gaillard, Ian Kelman, 2012. Routledge. Systems Approach to Management of Disasters: Methods and Applications, Slobodan P. Simonovic, 2011. Wiley.
- Disaster Management: A Disaster Manager's Handbook; Carter, W. Nick. Asian Development Bank, 2008.
- Disaster Management, Global Challenges; Krishnamurthy, et.al. University Press. 2009.
- Global Disaster Management; Arun Kumar: SBS publishers. UK edition. Feb.2008.
- Handbook of Disaster Risk Reduction & Management; Christian N Madu and Chu-Hua Kuei, 2017. World Scientific.
- Natural Calamities and Disaster Management; Rajesh Arora, Sonali Publications.
- Disaster Management Approaches and Strategies; Tej Singh. Akansha Publication House New Delhi.

1st SEMESTER		
Course Title: Understanding Hazards and Earth Surface Processes		
Course Code: DM-C-102	Category: Core	Credit: 04

Course Outcome: This course has been designed to discuss the concept, nature, origin and types of disasters in the backdrop of prevailing natural and anthropogenic disaster scenario across the world. The learners, apart from the historical background of disasters, will also understand the complexity of the disasters that originate due to Natural Processes, Human Interference with Nature or a combined effect of both natural process and human Activities.

Credit I

1. Hazards: Concept and Definition
2. Hazard Profile of India: An Overview
3. Classification of Hazards and their Strengths and Weaknesses
4. Hazards-Characteristic Features
5. Impacts of Hazards

Credit II

1. Earthquakes, Volcanic Eruptions
2. Glacial Lake Outburst Floods, Tsunami
3. Land Slides, Snow Avalanches
4. Heat and Cold Waves, Floods
5. Drought, Cyclones

Credit III

1. Interior of the earth and its composition
2. Wilson Cycle; Sea floor Spreading; Continental Drift
3. Forces of Crustal Instability: Concept of Plate Tectonics, Dynamics of Plate Margins
4. Mountain belts and adjacent sedimentary basin;
5. Subduction Processes: Accretion, deformation and exhumation

Credit –IV

1. Concept of Gradation - types, classification and effects of weathering.
2. Cycle of Erosion; Kinematics of Orogenic belts;
3. Mass wasting.
4. Examine relation between Deep earth and surface processes in different tectonic regions (mountains; coastal; oceanic belt)
5. Geophysical techniques and seismological methods of imaging deep earth (Geotomography; Electrical; Electromagnetic; Gravity; Seismic and Magneto-telluric passive source tomography).

Suggested Readings:

- An Introduction to Disaster management; S. Vaidyanathan.
- Text Book of Disaster Management; Bandla Srinivas. ATPA
- Resource Book on Chemical (Industrial) Disaster Management; Anil K. Gupta, 2016.
- Encyclopedia of Disaster and Hazards Management. Oxford Book Company
- Environmental Disasters; KK Singh, et. Al. APH Publishers
- Forest Fire Disaster Management. NIDM
- Forest Fire Disaster Management; Satendra, 2014. A. D. Kaushik
- Geological Hazards and Hydro-meteorological Hazards www.nidm.gov.in
- Man-made Disasters; Barry A. Tuner, Nick Pidgeon.

- Resource Book on Chemical (Industrial) Disaster Management; Anil K Gupta, 2016.
- Earthquake & Natural Disasters; Manik Kar. Motilal Banarsidass Publishers Private Limited
- Strahler A (1996): Introducing Physical Geography, John Wiley and Sons.
- Singh S (2015): Geomorphology, Pravalika Publications. Allahabad.
- Hagget R (2010): Physical Geography: The Key Concepts. Taylor and Francis. London and New York.
- Phillip A (1997): Earth Surface Process. Wiley-Blackwell. ISBN-0632035072.
- Steven ID (2012): Earth Material and Resources (Earth Science). Har/Psc Edition.

1st SEMESTER		
Course Title: Remote Sensing, GIS and GPS		
Course Code: DM-C-103	Category: Core	Credit: 04

Course Outcome: The course aims to develop and enhance student's theoretical understanding of Remote Sensing, Geographic Information System (GIS) and Global Positioning System (GPS). The students would gain understanding of electromagnetic spectrum, Image Interpretation, and image processing. In addition to that this course would include study of the GIS components, data models, GPS segments and applications. The course is expected to train the students for onscreen visualization, interpretation and management of the earth's surface features and processes from regional and global dimensions to handle the complexity of the disasters in the field of disaster management.

Credit-I

1. Fundamentals of Remote Sensing
2. Electromagnetic Spectrum (EMS)
3. Energy Interactions with Atmosphere and Earth Surface Features
4. Image Interpretation
5. Introduction to Digital Image Processing

Credit-II

1. Remote Sensing Systems
2. Earth Observation Space Programmes
3. Platforms – Types and Functions
4. Sensors-Active/ Passive. Multispectral and Hyperspectral Systems
5. RADAR and LIDAR Systems

Credit-III

1. Introduction to Geographic Information System
2. Components of GIS
3. Spatial and Non-Spatial Data
4. Data Models- Raster and Vector, Processing and Analysis
5. Data dissemination

Credit-IV

1. Introduction to Global Positioning system (GPS)
2. GPS Segments
3. Fundamentals of GPS Positioning
4. Sources of Errors and Limitations
5. Applications of GPS

Suggested Readings:

- Environmental Modelling with GIS and Remote Sensing, Andrew Skidmore, 2003
- Remote Sensing, Principles and interpretation, Floyd F. Sabins Jr., 1987. W.H. Freemanes & Co., New York, 2nd Edition.
- Integration of GIS and Remote Sensing, Victor Mesev, 2008.
- Introduction to Remote Sensing, James B. Campbell, Randolph H. Wynne; Fifth Edition.
- A Guide to Effective Map Design, N. Peterson, 2009, GIS Cartography. Gretchen, New York.
- Remote Sensing and Global Environmental Change; Sam J. Purkis and Victor V. Klemas, 2011,
- GIS Solutions in Natural Resource Management; Stan Marany, 1999. Onward Press, USA

1 st SEMESTER		
Course Title: Early Warning, Forecasting and Communication		
Course Code: DM-EL-104	Category: Elective	Credit: 02

Course Outcome: In this course the students will come to know about the technology based Disaster Forecast, Prediction and Early Warning System as a means of capacity building with respect to various geological, hydro metrological disasters. The course also aims at familiarizing the learners with important national and international agencies for the Prediction, Forecasting and Early Warning Systems for coordinated efforts in disaster mitigation and resilience.

Credit - I

1. Disaster Prevention: Concept and Significance
2. Capacity Building
3. Mass Awareness
4. Technology Driven Initiatives in Disaster Prevention
5. Agencies involved in Disaster Prevention

Credit - II

1. Early Warning System (EWS): Need, Significance and Challenges
2. EWS for Earthquakes, Landslides and Avalanches
3. EWS for Floods and Droughts
4. EWS for Tsunami
5. National and International Agencies for Forecasting and Early Warning Systems

Suggested Readings:

- Disaster Management and Preparedness; Collins Larry R. and Schneid Thomas D. 2000. Taylor and Francis.
- Disaster Mitigation Experiences and Reflections; Sahni, Pardeep. et.al. 2002. Prentice Hall of India, New Delhi.
- Natural Hazards: Local, National, Global; White, G.F, 1974. Oxford University, Press, New York.
- Assessment of Research on Natural Hazards; White, Gilbert F. and J. Eugene Hass, 1975. Cambridge, MIT Press.
- Disaster Management and Risk Reduction; Vishwa Bahar Prasad Seti.
- A practical guide to Disaster Management; A. K. Jain. Motilal Banarsidass Publishers Private Limited.
- EIA & Disaster Management; Alok Satsangi. Rajat Publishers.

1 st SEMESTER		
Course Title: Environmental Impact Assessment and Management		
Course Code: DM-EL-104	Category: Elective	Credit: 02

Course Outcome: The EIA is very important and has to be undertaken early in the development of proposed projects, plans and programmes and must be completed before a decision to proceed is made. Thus during the course students will be given information about the concept, approaches and legal provisions of EIA/EMP and the various methodologies applied while doing EIA.

Credit-I

1. EIA: Concept, Objectives and Approaches
2. Baseline Data Generation and Strategic Environmental Assessment
3. EIA Guidelines and Legal Provisions
4. Public Participation in Environmental Decision Making
5. National Policy for Resettlement and Rehabilitation (NPRR)

Credit-II

1. Methodologies of EIA: Quantification of Environmental Impact
2. Concept of Disaster-Environment Matrix
3. Matrices, Networks, Cost-benefit Analysis, Overlay Maps
4. Ecological Assessment
5. Social Impact Assessment

Suggested Readings

- Alan Giplin, 1995, Environmental Impact Assessment.
- Charles H. Eccleston, 2011, Environmental Impact Assessment.
- John Glasson, Riki Therivel, and Andrew Chadwick, 2013, Introduction to Environmental Impact Assessment.
- Neil Craik, 2010, The International Law of Environmental Impact Assessment.

1 st SEMESTER		
Course Title: National and Regional Hazard Profile		
Course Code: DM-MD-106	Category: Multidisciplinary	Credit: 02

Course Outcome: The course is intended to familiarise the learners about the diverse disaster Profile of India including Jammu and Kashmir as a Multi-Hazard zone. The vulnerability of coastal states to cyclones and tsunamis; Himalayan states to earthquakes, floods, landslides and avalanches and the plain areas to drought and floods are the focus of studies apart from the epidemics and Traffic Accident disasters in India. The learners are expected to get acquainted with these hazards and disasters in the light of hazard exposure, risk and vulnerability of the specific areas and people across the country. Besides, the course aims to enhance the understanding of local disaster scenario with the help of case studies of recent disasters in Jammu and Kashmir.

Credit-I

1. Hazard Profile of India: An Overview
2. Earthquakes and Tsunami
3. Landslides and Snow Avalanches
4. Floods, Droughts and Cyclones
5. Epidemics and Accidents

Credit II

1. Ladakh: A Multi-Hazard Zone
2. Earthquake: Historical Perspective and Vulnerability
3. Floods: Zonation and Mitigation
4. Landslides and Snow Avalanches- Zonation and Mitigation
5. Recent Disasters in Ladakh (Case Studies)

Suggested Readings:

- Disaster Management in India: Structure and Challenges; Purohit Jyoti, 2013. Lambert Publication.
- A Manual on Disaster Management. Parag Diwan, 2010. Pentagon Earth.
- Disaster Management. G. K. Gosh. A.P.H. Publishers.
- DISASTER MITIGATION: EXPERIENCES AND REFLECTIONS; Pardeep Dhameja, 2004. PHI Pub.
- Disaster Management in India; Rajendra Kumar Pandey, 2020. SAGE Publications India Pvt Ltd
- <https://leh.nic.in/document-category/disaster-management/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483513/>
- Disasters ad Ladakh: Actions point for Management. GB Panth National Institute of Himalayan Studies, https://gbpihed.gov.in/PDF/Publication/Disaster_and_Ladakh_2020.pdf

2nd SEMESTER		
Course Title: Vulnerability Assessment		
Course Code: DM-C-201	Category: Core	Credit: 04

Course Outcome: This course aims to promote understanding pertaining to various physical, social, economic, and environmental aspects of vulnerability. The learners are expected to be updated about the various criterions of vulnerability assessment, vulnerability analysis of India especially the Himalayan cities, shanty settlements and strategic planning for vulnerability reduction.

Credit-I

1. Vulnerability: Concept and Nature
2. Vulnerability: Types and Dimensions
3. Causes of Vulnerability
4. Vulnerability and Risk Relationship
5. Vulnerability Evaluation

Credit-II

1. Vulnerability Indicators and their Limitations
2. Vulnerability Assessment: Approaches
3. Vulnerability Assessments Methods
4. Vulnerability Assessment Models (PAR/SVM)
5. Vulnerability Mapping

Credit-III

1. Vulnerability Analysis with reference to India
2. Rural-Urban Vulnerability
3. Vulnerability of Himalayan Cities
4. Vulnerability of Shanty Settlements
5. Vulnerability of Weaker Sections

Credit-IV

1. Strategic Planning for Vulnerability Reduction
2. Policy Making for Vulnerability Reduction
3. Physical and Social Infrastructure for Vulnerability Reduction
4. Impediments in Vulnerability Reduction in India
5. Development for Survival and Vulnerability Reduction

Suggested Readings:

- Measuring Vulnerability to Natural Hazards; Birkmann, 2007.
- Disaster Risk and Vulnerability; David Etkinand Chowdhury, Emdadul Haque, 2012.
- Mapping Vulnerability: Disasters, Development and People; Greg Bankoff and Georg Frerks, 2013.
- Natural Hazards and Disaster Management: Vulnerability and Mitigation; J.B. Singh. 2006.
- Disaster Vulnerability Management and Mitigation; Seemin Mushir. 2018.
- Understanding Disaster Risk, A Multidimensional Approach. Pedro Santos et.al. 2020. 1st Edition. Elsevier Publications.
- Communicating Emergency Preparedness, Strategies for creating a Disaster Resilient Public; Damon, P.Coppola, Errin, K. Maloney. CRC Press London.

2nd SEMESTER		
Course Title: Disaster Rehabilitation, Reconstruction & Recovery		
Course Code: DM-C-202	Category: Core	Credit: 04

Course Outcome: This course is aimed to enhance the understanding of the students with respect to rehabilitation, reconstruction and recovery phase of disaster management. The students are expected to gain in-depth knowledge of physical, social and economic rehabilitation components and more importantly the learners will be able to know various rehabilitation processes and the services required in reconstruction phase. The course is designed to understand —Build Back Better approach in RRR phase of disaster Management involving the restoration of the community livelihoods, amenities, critical infrastructure medical aid therapy, essential services, resource mobilization, Insurance, waste and debris management and employment generation with the intervention of foreign authorities, local government authorities national and international NGO's and CBO's

Credit-I

1. Rehabilitation, Reconstruction and Recovery (RRR): Concept and Types
2. Introduction to Short and Long Term Recovery Aspects
3. Community Participation in RRR
4. Priorities in Recovery
5. Capacity Building and Self-Help Initiatives

Credit -II

1. Disaster Rehabilitation: concept and significance
2. Physical, Economic and Social Rehabilitation
3. Resource Mobilization for Rehabilitation
4. Restoration of Basic Amenities
5. Medical Aid Therapy and Counseling- Psycho-Social Issues

Credit -III

1. Capacity Building for Reconstruction under BBB Approach
2. Development of Essential Services and Social Infrastructure
3. Creation of long term Job opportunities and Livelihoods
4. Opportunities and constraints in Reconstruction
5. Participatory Rural Appraisal (PRA)

Credit -IV

1. Role of Government in Disaster Recovery and Rehabilitation
2. Role of NGO's and Local Institutions in Disaster Recovery and Rehabilitation
3. Role of Insurance Companies in Disaster Recovery and Rehabilitation
4. Role of Media in Disaster Recovery and Rehabilitation
5. Monitoring and Evaluation of Rehabilitation Work

Suggested Readings:

- Post-Earthquake Rehabilitation and Reconstruction; F.Y. Cheng and Y.Y. Wang, 1996.
- Disaster Management and Rehabilitation; Rajdeep Dasgupta, 2007.
- Disaster Response and Recovery: Strategies and Tactics for Resilience. David A. McEntire, 2014, Wiley Publications.
- Disaster, Vulnerability and Rehabilitation: A Study of Uttarakhand; Bindeshwar Pathak and Satyendra Tripathi. 2019. Rawat Publications.
- Disaster Preparedness and Rehabilitation; P. Chandra. Arise Publishers

2nd SEMESTER		
Course Title: Geospatial Tools and Risk Sensitive Landuse Planning		
Course Code: DM-C-203	Category: Core	Credit: 04

Course Outcome: Geo-informatics plays a significant role in disaster management. The said course highlights all the domains with respect to the application of Geospatial tools and techniques in disaster management. In this course students will get hands on experience on how satellite data and GIS and field observations can help in a better way to retrieve essential information for disaster risk reduction. Damage assessment associated with a particular disaster and mapping critical infrastructure at risk, pre and post disaster scenarios would also be covered. The risk sensitive land use planning will enable to analyse the responsiveness of land use planning practice and their enforcement in relation to disaster risk reduction. It explains the concept, relevance, principles, factors, drivers, and methodology of risk sensitive land use planning.

Credit-I

1. GIS Framework for Disaster Management
2. Open Source GIS Software
3. Smartphone based GIS Apps
4. Acquisition of Satellite and GIS Data
5. Acquisition of Ancillary Data

Credit-II

1. Integration of Data Sets
2. Volunteered GIS Mapping
3. Seismic Risk Mapping
4. Urban Fire Risk Mapping
5. Damage Assessment

Credit-III

1. Water Quality Mapping
2. Temperature Variability Mapping
3. Rainfall variability mapping
4. Snowfall hazard mapping
5. Landslide hazard Mapping

Credit-IV

1. Disaster Sensitive Land Use Planning – Concept, Objectives and Significance
2. Factors Governing Land Utilization
3. Drivers of Land Use Change
4. Land Use Zoning, Land Suitability and Land Sensitivity
5. Land Use Policy of India

Suggested Readings:

- Comprehensive Disaster Management and Development; Leonard James Fendel, 2006.
- NIDM, Geoinformatics for Disaster Management, www.nidm.gov.in
- Geo-information for Disaster Management; Peter van Oosterom, and Elfriede Huggins, 2007.
- Geoinformatics For Disaster Management; Rao, K V G, 2010.
- Geoinformatics For Disaster Management; K. Venu Gopal Rao.
- Remote Sensing and GIS Technologies for Monitoring and Prediction of Disasters Environmental Science and Engineering; Shailesh Nayak.
- Urban Land Use Planning, 4th Edition; Edward S. Kaiser and F. Stuart Chapin, 1957.
- Land Use Planning Made Plain; Hok-Lin Leung, 2003, University of Toronto Press.
- Land-Use Planning for Sustainable Development, Second Edition; Jane Silberstein, M.A., and Chris Maser, 2013, CRC Press.

2 nd SEMESTER		
Course Title: Introduction to Seismic Risk Reduction		
Course Code: DM-EL-204	Category: Elective	Credit: 02

Course Outcome: Earthquake being the one hazard that comes with no warning thus requires different kind of prevention mitigation and preparedness measures. The course is expected to familiarise the learners about the nature and consequences of earthquakes, magnitude and intensity, poor technological advancement for the prediction and forecasting of the earthquakes vis-à-vis the need of different preventive measures especially the structural measures. The course would make the learners aware about various traditional and modern architectural designs for buildings. The course also aims at NDMA guidelines, National building codes and byelaws for construction of seismic resistant structures to mitigate the impacts of seismic disasters.

Credit- I

1. Seismic Risk: Concept
2. Earthquake Occurrence and Measuring Scales
3. Earthquake Prediction
4. Seismic Zonation
5. Liquefaction and Mitigation Methods

Credit- II

1. Earthquake Mitigation Strategies
2. Earthquake Mitigation Measures at Home
3. NDMA Guidelines on Management of Earthquakes 2007
4. Guidelines for Mud and Brick Construction in Ladakh
5. Traditional Earthquake Resilient Construction practices

Suggested Readings

- Earthquake & Natural Disasters; Manik Kar.
- Natural hazards & DM Vulnerability & Mitigation. Singh R.B.
- Safety and Disaster Management Methods, Techniques, Recent Approach, Major Events & Exist Framework Hazardous Material; Dutta O. P.
- Geological Hazards Their assessment avoidance and mitigation; Bell, F.G. Routledge, London,
- Earthquake Research and Analysis; Sebastiano D. Amico, 2014, Intech.
- Basic Search & Rescue Skills Emergency Response International; www.erionline.com.
- Earthquake Prediction; www.world-earthquakes.com
- Earthquake Safety; <http://www.bmtpc.org>
- Earthquake Tips; <http://www.nicee.org>
- Safety and Disaster Management Methods, Techniques, Recent Approach. O. P. Dutta.
- School Safety Initiatives, Geo Hazards Society; <http://www.geohaz.in>.
- Disaster Safe Homes; Warne Josheph.

2 nd SEMESTER		
Course Title: DRR, Adaptation and Resilience		
Course Code: DM-EL-204	Category: Elective	Credit: 02

Course Outcome: This course covers various aspects of disaster risk reduction and development planning. The learners are expected to understand linkages between disasters and developmental planning; institutional arrangements for planning at International, National and Regional level and get understanding of how developmental planning can minimize the losses associated with disasters.

Credit - I

1. Evolution and Objectives of DRR
2. International Mobilization for Risk Reduction
3. Case Studies of DRR Initiatives at National and Regional Level
4. DRR Master Planning for Sustainable Development
5. Community Based DRR

Credit - II

1. Disaster-Development Relationship
2. Developmental Planning in Context of DRR
3. Developmental Planning in Relation to Capacity, Resilience and Vulnerability
4. Decision Making for DRR
5. Application of IEC and Technology in DRR

Suggested Readings:

- Mapping Vulnerability: Disasters, Development and People; Greg Bankoff and Georg Frerks, 2013.
- Natural Disaster and Development in a Global World; Mark Pelling, 2003. Routledge.
- Disaster and Development; Misanya Doreau, 2011. VDM Variag Publishers.
- Disaster and Development: An Occupational Perspective; Nancy Rushford and Kerry Thomas, 2015. Churchill Livingstone.
- Disaster Risk Reduction in South Asia; PardeepSahni, 2003, Prentice Hall of India, New Delhi.
- Disaster and Development: An Occupational Perspective; Nancy Rushford. 2015. Churchill Livingstone Pub.

2 nd SEMESTER		
Course Title: Human Induced Disasters and Their Management		
Course Code: DM-MD-206	Category: Multidisciplinary	Credit: 02

Course Outcome: The course would particularly emphasize on disasters induced by humans. Discussion on potential hazards and effects would be focus here. In addition, the course would cover the deliberations on various case studies.

Credit-I

1. Chemical, Biological, Radiological and Nuclear Hazards
2. Air Pollution
3. Water Pollution
4. Epidemics
5. Cyber Crimes

Credit- II

1. Accidents: Rail, Road and Air
2. Fires: Urban and Forest
3. Deforestation and Land Degradation
4. Mine Disasters and Dam Failures
5. Civil Strife

Suggested Readings:

- Environmental Disasters; K. K Singh. et. al. APH Publishers
- An Introduction to Disaster management; S. Vaidyanatahn.
- Bandla Srinivas: Text Book of Disaster Management. ATPA.
- Encyclopaedia of Disaster and Hazards Management; Rajesh K Yadav., et al. Oxford Book Company
- Man-made Disasters; Barry A. Tuner, Nick Pidgeon.
- Encyclopedia of Disaster Management; P.C Sinha. Anmol Publishing House.
- Century of Man-Made Disasters (Images of the Past); Nigel Blundell, 2019. Pen and Sword History Pub.
- Catastrophes and Heroes: True Stories of Man-made Disasters; Jerry Borrowman, 2020. Shadow Mountain Pub.

3rd SEMESTER		
Course Title: Disaster Mitigation and Preparedness		
Course Code: DM-C-301	Category: Core	Credit: 04

Course Outcome: The present course is designed to provide the learners an in-depth understanding of how to minimise the impact of hazards and disasters through various structural and non-structural measures by explaining the significance of planning and preparedness involving different stake holders in a hierarchical and coordinated manner. The learners would come to understand the importance of disaster mitigation and preparedness part of the disaster management cycle

Credit-I

1. Disaster Mitigation: Concept and Principles
2. Disaster Mitigation Strategies: Structural and Non-structural
3. Disaster Mitigation Strategies with reference to Cyclones, Drought, Floods and Landslides
4. Emerging Trends in Disaster Mitigation
5. Disaster Mitigation Programs in India

Credit-II

1. Disaster Preparedness: Concept and Significance
2. Disaster Preparedness Measures
3. Institutional Mechanism for Disaster Preparedness
4. Disaster Preparedness for People with Special Needs and Vulnerable Groups
5. Disaster Preparedness with reference to Housing and Infrastructure

Credit-III

1. Disaster Preparedness Plan: Concept and Significance
2. Essentials of Disaster Preparedness Plan
3. Community Based Disaster Preparedness- Need and Significance
4. Community Based Disaster Preparedness Plan
5. Community Participation- Task Force Formation, Training and Capacity Building

Credit-IV

1. Emerging Technologies in Disaster Preparedness and Mitigation
2. Role of IEC and Training in Disaster Preparedness and Mitigation
3. Role of International Agencies
4. NGO's in Disaster Preparedness and Mitigation
5. Role of Media in Disaster Preparedness

Suggested Readings:

- Disaster and Development; Andrew E. Colins, 2009. Routledge.
- Disaster Management Handbook; Jack Pinkowski, 2008.
- Disaster Management and Rehabilitation; Rajdeep Dasgupta, 2007.
- Community Based Disaster Risk Reduction; Rajib Shaw, 2012.
- Disasters, Development and People; Mapping Vulnerability; Greg Bankoff and Georg Frerks, 2013.
- Disaster Risk Reduction in South Asia; Pardeep Sahni, 2003, Prentice Hall of India, New Delhi.

3rd SEMESTER		
Course Title: Disaster Risk Assessment		
Course Code: DM-C-302	Category: Core	Credit: 04

Course Outcome: Risk assessment being an area of immediate importance for disaster risk reduction. During this course, students will be familiarised with the important components, approaches and other process involved in risk assessment. It also discusses the essentials of risk reduction and the targets for risk reduction with respect to specific natural hazards.

Credit-I

1. Concept of Disaster Risk Assessment
2. Inter-relationship between Hazard, Vulnerability and Disaster Risk
3. Disaster Risk Drivers
4. Global Risk Trends
5. Disaster Database Sources

Credit-II

1. UNDP Approach in Risk Assessment
2. UNDRR endorsed National Disaster Risk Assessment (NDRA)
3. Cross-border Risk Assessment
4. Participatory Disaster Risk Assessment
5. Disaster Risk Management

Credit-III

1. Methods for Risk Assessment
2. Tools in Disaster Risk Assessment
3. Disaster Risk Index
4. Damage, Loss and Needs Assessment Methods (DaLA, PDNA)
5. Disaster Risk Governance

Credit-IV

Hazard Specific Risk Assessment in context with :-

1. Earthquakes
2. Floods
3. Landslides
4. Wildfires
5. Biologic

Suggested Readings:

- Risk Assessment and Disaster Management; Akshaya Kumar Nayak & Kadambari Sharma.
- Disaster Risk and Impact Management, Approaches Tools and Strategies; Anil K Gupta Vnod, K. Sharma, Sreeja. Daya Pub House/Unit of Intl. Pvt. Ltd.
- Disaster Risk Reduction in South Asia; Pardeep Sahni and Madhavi Malalgoda Ariyabandu, 2003.
- Natural Disaster Risk Management and Financing Disaster; Reinhard Mechler, 2004.
- Risk assessment and disaster response; Siddhartha Gautam. Vista International Publishing House
- Disaster Risk Management Systems Analysis: A Guide Book; Stephan Baas, 2008.
- UNDRR-NationalDisasterRiskAssessmentwww.undrr.org
- Disaster Management and Risk Reduction; Vishwa Bahar Prasad Seti.
- Community-Based Disaster Risk Reduction; Rajib Shaw, 2012.
- Handbook of Hazards and Disaster Risk Reduction; Wisner J.C. Gaillard L Lan Kelman.

3rd SEMESTER		
Course Title: Economic and Financial Aspects of Disasters		
Course Code: DM-C-303	Category: Core	Credit: 04

Course Outcome: The course is aimed to help the learners in understanding the short and long term impacts of disasters on the economy of the affected community. The course highlights the need of disaster compensation, Post disaster Impact Assessment, Estimation of disaster losses, Disaster risk finance and Insurance, global facility for disaster reduction and recovery and Institutional arrangements for disaster risk management, Catastrophe Modelling, SIA, Disaster Risk matrix and Modelling; Funding and triangular Food Aid to mitigate the disaster impacts for ensuring quick recovery in the wake of a disaster.

Credit -I

1. Economic and Financial Implication of Disasters
2. Primary and Secondary Impacts of Disasters on Economy
3. Post Disaster Impacts on Market and Economy
4. GDP, Price, Supply Shock, Consumption Shock and Price Control
5. Disaster Compensation

Credit -II

1. Post Disaster Impact Assessment
2. Estimation of Disaster Losses
3. Catastrophe Modelling (Cat Modelling)
4. Social Impact Assessment (SIA)
5. Modelling of Disaster Implications on Economy

Credit -III

1. Disaster Risk Management for Resilient Development
2. Disaster Risk Analysis
3. Disaster Risk Matrix
4. Risk Exposure, Risk Bearing Capacity and Financial Vulnerability
5. Disaster Deficit Index and Economic Resilience

Credit -IV

1. Disaster Risk Transfer and Catastrophe Bonding
2. Disaster Reduction and Recovery (GFDRR)
3. Debit Swaps, Blocked Funds and Revolving Funds
4. Triangular Food Aid
5. Disaster Risk Finance and Insurance (DRFI)

Suggested Readings:

- Natural Hazards, Unnatural Disasters: The Economics of Effective Prevention. Bank Publications.
- Advances in Spatial and Economic Modelling of Disaster Impacts; Advances in Spatial Science, 2019. Springer Pub.
- Economic Effects of Natural Disasters: Theoretical Foundations, Methods, and Tools. 2020; Taha Chaiechi. Academic Press. Nov. 11, 2010. World
- Supply Chain Resilience: Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters, 1st ed.; Anbumozhi. 2020. Springer.
- Disaster Risk and Impact Management, Approaches Tools and Strategies; Anil K Gupta Vnod, K. Sharma, Sreeja. Daya Pub House-Unit of Intl. Pvt. Ltd.
- Disaster Risk Reduction in South Asia; Pardeep Sahni and Madhavi Malalgoda Ariyabandu, 2003.

- Natural Disaster Risk Management and Financing Disaster; Reinhard Mechler, 2004

3rd SEMESTER		
Course Title: Emergency Response and Crisis Management		
Course Code: DM-MD-304	Category: Core	Credit: 02

Course Outcome: The prompt and pro-active response to disasters can save millions of lives and reduce the overall adverse impact of disasters. This course highlights the role and responsibilities of incident response system for effective disaster response and the emergency response to different extreme events such as fire, floods etc.

Credit-I

1. Development of Incident Response System
2. Features and Logistics of Incident Response System
3. Incident Response Organizational Setup
4. Incident Resource Management
5. Role of Media in Emergency Response

Credit-II

Emergency Response and crisis management;

1. Fire Hazard
2. Flood Hazard
3. Chemical Hazard
4. Nuclear Hazard
5. Road/ Rail Accidents

Suggested Readings:

- ♣ Disaster Management Guidelines for Incident Response Information and Communication System; Reepunjaya Singh, 2016. Horizon Press
- ♣ Principles of Incident Response and Disaster Recovery. International Ed. 2013. Course Technology Inc.
- ♣ Disaster Response and Emergency Management; Alfred Scott, 2016. Syrawood Publishing House.
- ♣ IRS Guidelines by NDMA; Available at NDMA website.
- ♣ Case Studies in Disaster Response and Emergency Management. 2nd Ed; Nicolas A. Valcik and Paul E. Tracy, 2012. American Society for Public Administration.
- ♣ Disaster Management in India: Structure and Challenges; Purohit Jyoti, 2013. Lambert Publication.
- ♣ Basic Search & Rescue Skills Emergency Response International; www.erionline.com.
- ♣ Earthquake Safety; <http://www.bmtpc.org/>
- ♣ Safety and Disaster Management Methods, Techniques, Recent Approach; O. P. Dutta.
- ♣ School Safety Initiatives; Geo Hazards Society. <http://www.geohaz.in/>
- ♣ Earthquake Research and Analysis; Sebastiano D. Amico, 2014. Intech.

4th SEMESTER		
Course Title: Psychosocial Care in Disaster Management		
Course Code: DM-C-401	Category: Core	Credit: 04

Course Outcome: The course is designed to understand the human behaviour during and after the disasters. This course highlights the psychological problems faced by the relief providers as well as the victims and how to manage human behaviour through psychosocial care. It also focuses on psychosocial care management at international, national and regional level.

Credit I

1. Disaster Psychological Care: Concept
2. Psychological Implications of Disasters
3. Principles of Psychological Support
4. Techniques of Psychological Care
5. Psychological Care Essentialities

Credit II

1. Psychological Care Ethics
2. Psychological First Aid
3. Understanding Psychological Needs of Victim
4. Psychological Needs of Vulnerable People and Special Needs
5. Psychological Needs of Rescuer

Credit-III

1. Psychosocial Response
2. Psychological Debriefing
3. Stress Management
4. Rumour and Panic Management
5. Role of Information, Communication and Technology (ICT) in Psycho-social Response

Credit-IV

1. Psycho-social Care Management at International level
2. Psycho-social Care Management in India
3. Role of Different Government Agencies
4. Role of NGOs
5. Community Participation in Psychosocial Care Management

Suggested Readings:

- Case Studies in Disaster Response and Emergency Management, 2nd Edition; Nicolas A. Valcik and Paul E. Tracy, 2012. American Society for Public Administration.
- Disaster Management in India: Structure and Challenges; Purohit Jyoti, 2013. Lambert Publication.
- Disaster Management Psycho-Social Support and Health Services; 2010. Sumit Enterprises.
- Disaster Mental Health Services, Diane Myers and David Wee, 2004. Routledge Pub.
- IRS Guidelines by NDMA (Available at NDMA website)
- Disaster Response and Planning for Libraries, Third Edition; Miriam B. Kahn, 2012. ALA Editions.

4th SEMESTER		
Course Title: Climate Change & Community Based Disaster Management		
Course Code: DM-C-402	Category: Core	Credit: 04

Course Outcome: The course has been introduced to enable students to get insight about the genesis of climate change, its causes and implications and its interrelationship with various disasters. It also highlights the role of local bodies in managing disasters in the community more effectively.

Credit-I

1. Climate Change- A Historical Perspective
2. Impacts of Climate Change on Global Disaster Scenario
3. Emerging Trends of Climate Disasters
4. Climate Change: Drivers and Global Issues
5. Climate Change and DRR

Credit-II

1. Climate Change: Adaptation and Mitigation
2. Climate Change and Livelihood Protection
3. Policy Framework and Legislation
4. Resilience in Context of Indian- Subcontinent and JK
5. Economics of Climate Change

Credit- III

1. CBDM- Concept and Significance
2. Components of CBDM
3. Principles of CBDM
4. Characteristics of Safe and Resilient Community
5. Disaster Management and Community Planning

Credit- IV

1. Community based Disaster Capacity and Skill Development Training Programme
2. Community Disaster Response Team
3. Role of Social Workers in CBDM
4. Role of Panchayati Raj Institutions and Village Disaster Management Committee
5. Gender Minority and Ethnic Dimensions in Disaster Management

Suggested Readings:

- Hyogo Framework for Action and Urban Disaster Resilience: Community, Environment and Disaster Risk Management); Yuki Matsuoka, Rajib Shaw, 2014, Emerald Publishing Limited
- Water Communities: (Community, Environment and Disaster Risk Management); Rajib Shaw, Danai Thaitakoo, et al. 2010. Emerald Publishing Limited.
- Building Resilient Urban Communities: (Community, Environment and Disaster Risk Management); Yuki Matsuoka, Jonas Joerin, Rajib Shaw, et al. 2014. Emerald Publishing Limited
- Historical Perspectives on Climate Change; James Rodger Fleming, 1998. Oxford University Press.
- Climate Change: A Very Short Introduction; Mark Maslin, 2014. Oxford University Press.
- Climate Change: A Natural Hazard; William Kininmonth, 2004. Multi-science Publishing co. Ltd.
- Climate Change: Legal Issues & Contexts (Climate Change and Its Causes, Effects and Prediction: Laws and Legislation); Bailey summers and Ross A Diaz, 2013. Nova Science Publisher UK. Ed. Climate Change: Action, Trends and Implications for Business; Cambridge University

4 th SEMESTER		
Course Title: Search and Rescue Operations; and Post Disaster Management		
Course Code: DM-EL-403	Category: Elective	Credit: 02

Course Outcome: Disasters in densely populated areas/cities around the world have increased the need for sophisticated search and rescue capabilities to assist trapped victims. The said course is thus aimed at enabling students to learn about various search and rescue strategies, search plans and search priorities which will help the students to know how to search and rescue during earthquakes, floods, snow avalanches, landslides and building fires/collapse.

Credit-I

1. Concept of Search and Rescue (SAR)
2. Search and Rescue Teams and Equipments
3. Operational Methods in SAR
4. Role of different Organizations/Agencies in SAR
5. Search and Rescue at Community Level

Credit-II

Search and Rescue with reference to:

1. Earthquakes
2. Floods
3. Snow Avalanches
4. Landslides
5. Building Fires

Suggested Readings:

- National Urban Search and Rescue US&R Response System Field Operations Guide; 2013. Federal Emergency Management Agency Create Space Independent Pub.
- Basic Search & Rescue Skills Emergency Response International; www.eri-online.com
- Geo Hazards Society, Fire Safety; <http://www.geohaz.in/>
- Hydro Meteorological Hazards; www.nidm.gov.in
- Search and Rescue; <https://en.wikipedia.org>

4 th SEMESTER		
Course Title: Statistical techniques for Disaster Management		
Course Code: DM-EL-403	Category: Elective	Credit: 02

Course Outcome: Considering the broad scope for research in disaster management, this course covers different processes and methods involved in quantifying processes, and impacts in the field of disaster management. This course will enhance the statistical skills of the students while and will be useful for analysis of events, understanding behaviour and trends.

Credit-I

1. Statistical Analysis in Disaster Management
2. Data Collection and Processing
3. Sampling and its Types
4. Hypothesis and its Types
5. Hypothesis Testing

Credit-II

1. Correlation and Regression Analysis
2. Time Series Analysis
3. Analytical Hierarchy Process (AHP)
4. Composite Index
5. Mann Kendall and ANOVA Test

Suggested Readings:

- Basic Statistics; B. L. Agarwal, 2006.
- Fundamental Statistics for the Behavioural Sciences; David Howell, 2010.
- Poor Economics: Rethinking Poverty & the Ways to End it; Abhijit V. Banerjee, 2013. Penguin. Pub.
- Principles of Statistics; M. G. Bulmer, 1979.
- Introductory Statistics; Sheldon M. Ross, 2010.