University of Kashmir, Srinagar-6, J&K

NAAC Accredited Grade "A"

P.G. Department of Geography & Regional Development

(DST-FIST Sponsored and UGC-SAP Assisted Department)

COURSE STRUCTURE

FOR

CHOICE BASED CREDIT SYSTEM (CBCS)

OF

M. A. / M. Sc. Disaster Management

(2017 Onwards)

Department of Geography and Regional Development
University of Kashmir

(2017)

M.A/M.Sc. Disaster Management

Program Outcome: The incidence of natural and human induced disasters have assumed alarming dimensions both over temporal and spatial scales resulting in widespread loss of lives and assets globally. Collaborative efforts involving all stakeholders are required at various levels for making Disaster Risk Reduction (DRR) mechanism effective. In this direction, the introduction of Disaster Management Programme (M.A/ M. Sc.) by the University of Kashmir is an academic initiative expected to be very productive for addressing the various dimensions of Disaster Risk. The students of this programme are given a comprehensive exposure to the various facets of disaster management ranging from prevention, mitigation, preparedness to disaster response, forming the core components of the programme. The programme aims to prepare a pool of skilled human resource personnel who will become qualified and professional disaster managers. The graduates of the programme are expected to be equipped with a sound knowledge of theory and practical domains of the subject with professional execution capabilities. In addition the course offers substantial career opportunities to graduates of the programme in various regional, national, and international organizations.

Course Description:

M.A./M.Sc. Disaster Management is a two year course comprising of four semesters. The students are offered 45 papers that include Core Papers (12), along with Discipline Centric Elective Theory Papers (16), and Generic Elective Papers (8) and Open Elective Papers (8). Each Core Paper comprises of 4 credits. Discipline Centric Electives comprise of 4 credits and 2 credits. Whereas, Generic Elective and Open Elective Papers comprises of 2 credits each.

The M.A. /M.Sc. Programme in Disaster Management is based on 128 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 24 credits per semester i.e. 48 credits in one year programme (2 semesters) and a total of 96 credits in two year programme (4 semesters).
- Out of the 24 credits in a semester; 12 credits compulsorily are to be opted from "Core Courses", while the remaining12 credits can be obtained in either of the following two ways:
- 2-6 credits are to be obtained from Discipline Centric Courses. At least 4 credits are to be obtained from a pool of "Generic Electives" offered by the concerned faculty. However, a minimum of 4 credits from "Open Electives" are to be obtained by a candidate from outside the Department/Faculty in any semester while pursuing the programme; or
- A candidate has a provision to go with a slow pace of as low as 20 credits per semester or with an accelerated pace of as high as 28 credits per semester, so as to earn minimum required 96 credits in 2 year programme (4semesters).

Note: There shall be two faculty members in-charge of the Field Training Course (DM17303CR) in the 3rd semester to be conducted within or outside state. In the Field Training Course, each student shall have to prepare a report as per nature and purpose of the field.

All the faculty members shall provide supervision /guidance to the students for the preparation of the field study report (DM17303CR). A faculty member shall have to supervise a maximum of three students for preparation of the field report of DM17303CR.

The students shall have to deposit an amount of Rs.15,000/- as a part of fee towards the field studies over and above the prescribed fee for the course fixed by the University.

Semester-I

M.A./ M.Sc. Disaster Management Study Course Structure

Category	*Course Code*	*Course Title*	*Hours Per Week*			*Credits*
			Lecture	*Tutorial*	*Practical*	
Core	**DM17101CR**	Introduction to Natural and Human-Induced Disasters	4	2	0	4
	DM17102CR	Remote Sensing, GIS, and GPS-I	4	2	0	4
	DM17103CR	Remote Sensing, GIS, and GPS-II	0	0	8	4
Discipline Centric Elective	**DM17104DCE**	Fundamentals of Disaster Management	4	2	0	4
	DM17105DCE	Understanding Geophysical Environment	4	2	0	4
	DM17106DCE	Disaster Mitigation and Preparedness	4	2	0	4
	DM17107DCE	Regional Hazard and Disaster Management Scenario	4	2	0	4
Generic Elective	**DM17108GE**	Natural Hazards	2	1	0	2
	DM17109GE	Human-Induced Disasters	2	1	0	2
Open Elective	**DM17110OE**	Regional Natural Hazards	2	1	0	2
	DM17111OE	Earthquake Safety and Response	2	1	0	2
Total Contact Hours: 51			**Total Credits: 36**			

INTRODUCTION TO NATURAL AND HUMAN INDUCED DISASTERS DM17101CR

Course Outcome: This course covers all the major hazards having diverse nature. This course is aimed at making students understand fundamentals of natural and human-induced hazards. The students are expected to gain comprehensive knowledge about the types, causes, mechanism of occurrence, and spatial variability of hazards and disasters.

Credit-I

1. Introduction to Hazards and Disasters
2. Hazards: Types and Causes
3. Characteristics and Impacts of Hazards
4. Sources and Importance of Disaster Data

Credit –II

1. Flood
2. Drought
3. Tropical Cyclone
4. Snow Avalanches
5. Heat and Cold Wave

Credit –III

1. Earthquakes
2. Volcanic Eruption
3. Landslides
4. Tsunami

Credit –IV

1. Chemical, Biological, Radiological and Nuclear Hazards
2. Air Pollution, Water Pollution, Oil Spills
3. Urban Fires, Forest Fires, Coal Seam and Oil Well Fires
4. Land and Water Recourses Degradation
5. Rail and Road Accidents, Building Collapse

Suggested Readings

- Vogelbacher,2013, Flood Disaster Risk Management - Hydrological Forecasts - Requirements and Best Practices: Training Module
- Anil K. Gupta,2016, Resource Book on Chemical (Industrial) Disaster Management
- Bryant Edwards, 2005, Natural Hazard, Cambridge University Press.
- Donald Hyndman and David Hyndman, 2009, Natural Hazards and Bisasters, Brooks/Cole.
- Edward A. Keller and Robert .H. Blodgett, 2008, Natural Hazards, Pearson Prentice Hall.
- G. K. Gosh, Disaster Management, A.P.H. Publishers.
- Geological Hazards www.nidm.gov.in
- Hydro-meteorological Hazards www.nidm.gov.in
- K. K. Singh, Lotfi Aleya andVinod Singh, Disaster Management, Motilal Banarsidass Publishers Private Limited.
- Rajesh K. Yadav*et. al.* Encyclopaedia of Disaster and Hazards Management, Oxford Book Company

REMOTE SENSING, GIS AND GPS-I DM17102CR

Course Outcome: The course aims to make students understand basic theoretical concepts 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.

Credit-I

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

Credit-II

1. Remote Sensing Systems
2. E-O-Space Programmes
3. Platforms – Space borne / Airborne
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/Modelling
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

Suggested Readings

- Andrew Skidmore, 2003, Environmental Modelling with GIS and Remote Sensing,
- Floyd F. Sabins Jr. 1987, Remote Sensing, Principles and interpretation. W.H. Freemanes & Co., New York, 2nd Edition.
- Integration of GIS and Remote Sensing Victor Mesev–2008
- James B. Campbell, Randolph H. Wynne, Introduction to Remote Sensing, Fifth Edition.
- N. Peterson,2009, GIS Cartography: A Guide to Effective Map Design, Gretchen
- Sam J. Purkis and Victor V. Klemas, 2011, Remote Sensing and Global Environmental Change.
- Stan Marany, 1999, GIS Solutions in Natural Resource Management, Onward Press, USA.
- Thomas Martin Lillesand, Ralph W. Kiefer and Jonathan W. Chipman, 2004,Remote Sensing and Image Interpretation, Remote Sensing and GIS in Ecosystem Management.

REMOTE SENSING, GIS, AND GPS-II DM17103CR

Course Outcome: This is a practical course aimed at imparting proactive training to the students. The students will be given basic understanding about the types and characteristics of spatial data. Learners would be exposed to various softwares (e.g., Erdas Imagine 9.3; ArcMap 10.2) to handle, edit, integrate, and analyse geographic data for decision making. The students are also expected to be able to extract information from satellite data, map designing, and use 3D data for various applications. Moreover, the course aims to provide practical training to students for collection, transfer, and processing of GPS data for different application.

Credit-I

1. Introduction to Remote Sensing Softwares
2. Data- Formats and Exchange
3. Image Enhancement
4. Interpretation of Satellite Data, Classification - Supervised and Unsupervised
5. Accuracy Assessment.

Credit-II

1. Introduction to GIS Softwares
2. GIS Mapping- Vector Layer Creation (Point, Line, Polygon)
3. Attaching Attribute Data
4. Overlay Analysis (Multi-Criteria Analysis)
5. Map Designing

Credit-III

1. Working with 3D terrain data
2. Data Sources, Interpolating Point/Line Elevation Data
3. Digital Elevation Model (DEM) - Creation Methods
4. Terrain Analysis using DEM- Landform Analysis, Hypsometry, Derivation of Slope/Aspect
5. Watershed Delineation, Drainage Morphometric Analysis and Bathymetry

Credit-IV

1. Introduction to Global Positioning System (GPS) Survey
2. Handling and Operation of GPS
3. Data Collection using -Autonomous & Differential Mode
4. Post- Processing of GPS Data

Suggested Readings:

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

FUNDAMENTALS OF DISASTER MANAGEMENT DM17104DCE

Course Outcome: The course has been designed to deliver on basic concepts, principles, and significance of disaster management. The course would also cover best practices, changes, and new aspects of disaster management. The learners would get knowledge of frameworks adopted for disaster risk reduction over the period of time that has come up in the backdrop of various world disaster conferences. Moreover, the course covers disaster management policies as case studies from under developed, developing and developed nations.

Credit-I

1. Disaster Management- Concept
2. Disaster Management Cycle
3. Disaster Management Policy: Principles and Significance
4. Essential Components of Disaster Management Policy: Formulation & Execution.

Credit-II

1. Paradigm Shift in Disaster Management
2. Disaster and Development Planning
3. Community Based Disaster Management (CBDM).
4. Human and Legal Aspects of Disaster Management

Credit -III

1. International Decade for Natural Disaster Reduction (IDNDR) (1990's)
2. Yokohama Declaration (1994)
3. Hyogo Framework for Action (HFA, 2005-2015)
4. Sendai Framework for Disaster Risk Reduction (2015-2030)

Credit -IV

1. Case Studies of:
   i) Disaster Management Policy of United States of America
   ii) Disaster Management Policy of Bangladesh
   iii) Disaster Management Policy of India

Suggested Readings

- A Manual on Disaster Management. Parag Diwan (2010), Pentagon Earth.
- Bryant Edwards., Natural Hazards, Cambridge University Press, U.K, 2005.
- Carter, W. Nick., Disaster Management: A Disaster Manager's Handbook Asian Development Bank, 2008.
- Damon Coppola. Introduction to International Disaster Management 3rd Edition, 2015.
- David Etkin Disaster Theory: An Interdisciplinary Approach to Concepts and Causes, 2014.
- Disaster Risk Management Systems Analysis: A Guide Book. Stephan Baas (2008). Food and Agriculture Organization of the United Nations.
- Handbook of Disaster Risk Reduction & Management. Christian N Madu and Chu-HuaKuei (2017).World Scientific.
- Handbook of Hazards and Disaster Risk Reduction. Ben Wisner, J.C. Gaillard, Ilan Kelman(2012) Routledge.
- H.K. Gupta., Disaster Management, 2003.
- Patrick L. Abbott., Natural Disasters, McGraw-Hill Higher Education, 2004.
- Systems Approach to Management of Disasters: Methods and Applications, Slobodan P. Simonovic (2011). Wiley.
- http://www.unisdr.org/
- http://www.ndma.gov.in/en/
- http://nidm.gov.in/default.asp
- https://www.fema.gov/

UNDERSTANDING GEOPHYSICAL ENVIRONMENT DM17105DCE

Course Outcome: This course aims to provide understanding of geomorphology, hydrosphere, atmosphere and cryosphere. Their dynamics, role and impact on geophysical environment; and importance for understanding disaster profile of a region would also be covered.

Credit-I

1. Role of Geomorphology in understanding Disaster Profile of a Region
2. Concept of Landform Evolution and Earth Movements
3. Geomorphic Agents and Processes
4. Configuration of Oceans and Continents

Credit-II

1. Hydrosphere
2. Coastal Geomorphology, Ocean Currents and their Importance
3. Role of Oceans in Shaping the Geo-Ecology of Surrounding Land-Masses
4. El Nino, Southern Oscillations and La-Nina Phenomena, Sea Waves and Storm Surges

Credit- III

1. Atmosphere- Composition and Structure
2. Insolation, Heat-Balance of the Earth
3. Extreme Weather Events- Cyclones, Thunder Storms, Lightning, Hail Storms, Windstorms and Cloudbursts
4. Green House Effect and Global Climate Change

Credit- IV

1. Cryosphere-principal processes controlling glaciers, ice sheets and snow cover
2. General patterns in Greenland, Antarctica, Patagonia, Iceland, and Himalaya
3. Glacial Dynamics (Mass Balance, Glacial and Snowmelt Runoff)
4. Cryosphere and Global Water Security

Suggested Readings

- Alam Clowes and Comfort, Processes and Landforms.
- Bloom, A.L., Geomorphology-A systematic Analysis of Late Cenozoic Landforms.
- Wilfried Brutsaert, 2005,Hydrology**:** An Introduction.
- Steers, J.A., Unstable Earth.
- Strahler, A.H. &Strahler, A.H., Elements of Physical Geography.
- Thornbury, W.D., Principles of Geomorphology.

DISASTER MITIGATION AND PREPAREDNESS DM17106DCE

Course Outcome: With emphasis on mitigation and preparedness, the course covers various aspects of Disaster Management at different levels. Significance of planning and preparedness involving different stakeholders at different levels are also part of the course. The students are anticipated to understand the importance and means of disaster preparedness and mitigation.

Credit-I

1. Disaster Preparedness: Concept and Significance
2. Disaster Preparedness Measures and Plan
3. Institutional Mechanism for Disaster Preparedness

Credit-II

1. Disaster Preparedness for People with Special Needs and Vulnerable group (Women, Children, Especially Abled, Elderly)
2. Preparedness with Reference to Housing and Infrastructure.
3. Community Based Disaster Preparedness-Need and Significance

Credit-III

1. Structural and Non-structural Mitigation
2. Societal Perspectives on enhancing Preparedness
3. Resilience, Social Capital, Adaptation and Socio- Political Transformation
4. Adoption and enforcement of Land use and Zoning Practices

Credit-IV

1. Role of IEC (Information, Education and Communication) and Training
2. Role of International Agencies
3. Role of NGO's

Suggested Readings

- Collins Larry R. and Schneid Thomas D. 2000, Disaster Management and Preparedness, Taylor and Francis.
- Managing Disaster Risk in Emerging Econom(eds.)
- Sahni, Pardeep et.al. (eds.), 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.
- White, G.F, 1974, Natural Hazards: Local, National, Global, Oxford University Press, New York.
- White, Gilbert F. and J. Eugene Hass, 1975, Assessment of Research on Natural Hazards, Cambridge, MIT Press.

REGIONAL HAZARD AND DISASTER MANAGEMENT SCENARIO DM17107DCE

Course Outcome: The course is intended to acquaint students about the hazard, exposure, and vulnerability scenario of Jammu and Kashmir. Besides, the course would deal with the recent and historical perspective of disasters in Jammu and Kashmir. The course would cover the disaster management structure of Jammu and Kashmir and the role of different organization in disaster management as well.

Credit-I

1. Historical Disaster Scenario of Jammu and Kashmir
2. J&K: A Multi-Hazard Zone
3. Case Study/Examples from Recent Disasters - 2014 Flood, 2010 Leh Flash Flood , 2005 Earthquake, 2005Waltengo Snow Avalanche

Credit-II

1. Seismic Sensitivity of Kashmir Himalaya
2. Weather and Climate Variability in Jammu and Kashmir: Causes, Effects and Adaptation Strategies
3. Hydrological and Drainage characteristics of Jammu and Kashmir
4. Geomorphic Configuration and Flood Inundation Scenario of Kashmir valley

Credit-III

1. Water resource availability; distribution pattern and recent variability
2. Land Use and Land Cover Change: Drivers and Effects
3. Social, economic, and demographic Construction of Risk: Regional Situation
4. Regional Disaster and Development Status

Credit-IV

1. State Disaster Management Policy and Plan
2. SDMA Structure
3. SDRF and its Role in Disaster Management
4. Role of NGO's

Suggested Readings

- A. N. Raina, 1981, Geography of Jammu and Kashmir,
- Disaster Management Policy of Jammu and Kashmir-Document -2012
- Majid Husain, 1998, Geography of Jammu and Kashmir.
- Qazi, S.A. 2005, Systematic Geography of Jammu and Kashmir.

NATURAL HAZARDS DM17108GE

Course Outcome: The aim of this course is to apprise students about various hydro-meteorological and geological hazards. The learners would get an understanding of causes, classification, spatial variability and effects of the natural hazards.

Credit- I

1. Cyclone
2. Flood
3. Drought
4. Avalanche
5. Wild Fires

Credit- II

1. Earthquake
2. Tsunami
3. Landslide
4. Volcanic Eruption
5. Land Subsidence

Suggested Readings

- Anil K. Gupta &Sreeja S. 2012,Environmental Extremes: Disaster Risk Management.
- Bryant Edwards, 2005, Natural Hazard , Cambridge University Press
- Donald Hyndman and David Hyndman, 2009, Natural Hazards and Disasters, Brooks/cole.
- Edward A. Keller and Robert .H. Blodgett, 2008, Natural hazards. Pearson Prentice Hall.
- Hydro-meteorological Hazards, www.nidm.gov.in
- NIDM Publications, www.nidm.gov.in

HUMAN-INDUCED DISASTERS DM17109GE

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

Credit-I

1. Chemical
2. Biological
3. Radiological
4. Nuclear

Credit- II

1. Rail, Road, and Air Accidents
2. Fires(Urban and Forest)
3. Oil and Gas Leaks
4. Land and Water Recourses Degradation

Suggested Readings

- Anil K Gupta, 2016,Resource Book on Chemical (Industrial) Disaster Management.
- Forest Fire Disaster Management, www.nidm.gov.in
- NIDM Publications, www.nidm.gov.in
- Satendra, A. And D. Kaushik, 2014,Forest Fire Disaster Management.

REGIONAL NATURAL HAZARDS DM17110OE

Course Outcome: In this course the learners would get accustomed with knowledge about hazards with special reference to this region (Kashmir). Genesis, types, spatio-temporal variability of natural hazards and their effects on society would be primary focus here.

Credit- I

1. Floods
2. Drought
3. Avalanche

Credit- II

1. Earthquake
2. Landslide

Suggested Readings

- Anil K. Gupta & Sreeja S. 2012, Environmental Extremes: Disaster Risk Management.
- Bryant Edwards, 2005, Natural Hazard, Cambridge University Press.
- Donald Hyndman and David Hyndman, 2009, Natural Hazards and Disasters, Brooks/cole.
- Edward A. Keller and Robert .H. Blodgett, 2008, Natural hazards. Pearson Prentice Hall.
- Hydro-meteorological Hazards, www.nidm.gov.in
- NIDM Publications, www.nidm.gov.in

EARTHQUAKE SAFETY AND RESPONSE DM17111OE

Course Outcome: Earthquake being the one hazard that comes with no warning thus requires different kind of prevention, mitigation and preparedness measures. This course covers various safety and response measures desired for reducing the earthquake impact. The course would include various fundamental concepts of seismic hazard; structural and non-structural measures and safety aspects of the hazard.

Credit- I

1. Understanding Seismic Hazard
2. Magnitude and Intensity
3. Liquefaction - Implications and Mitigation
4. Earthquake Prediction

Credit- II

1. Earthquake Resistant Structures
2. Earthquake Mitigation at Household Level
3. Emergency Response to Earthquakes
4. Mock Drill and Simulation

Suggested Readings

- Atkinson, G.M., and Boore, D.M., 2006, Earthquake Ground-motion Predictions for Eastern North America, *Bull.Seismo. Soc. Am.*, 96, 2,181–2,205.
- 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/
- Major Events & Exist Framework Hazardous Material
- O. P. Dutta, Safety and Disaster Management Methods, Techniques, Recent Approach
- School Safety Initiatives, GeoHazards Society, http://www.geohaz.in/
- Sebistiano D. Amico, 2014, Earthquake Research and Analysis, Intech.

Semester-II

M.A./M.Sc. Disaster Management Study Course Structure

Category	*Course Code*	*Course Title*	*Hours Per Week*			*Credits*
			Lecture	*Tutorial*	*Practical*	
Core	**DM17201CR**	Disaster Response	4	2	0	04
	DM17202CR	Rehabilitation, Reconstruction and Recovery	4	2	0	04
	DM17203CR	Geoinformatics for Disaster Management	0	0	8	04
Discipline Centric Elective	**DM17204DCE**	Institutional Structure for Disaster Management	4	2	0	04
	DM17205DCE	Statistical Techniques for Disaster Management	4	2	0	04
	DM17206DCE	Disaster Management in India	2	2	0	02
	DM17207DCE	Waste and Debris Management	2	2	0	02
Generic Elective	**DM17208GE**	Geo-Spatial Tools for Disaster Management	2	1	0	02
	DM17209GE	Disaster Profile of India	2	1	0	02
Open Elective	**DM17210OE**	Global Positioning System (GPS)	2	1	0	02
	DM17211OE	Flood Safety and Response	2	1	0	02
Total Contact Hours: 52 Per Week			**Total Credits: 32**			

DISASTER RESPONSE DM17201CR

Course Outcome: The course would deal with essential components of response: rescue, participation, and stake-holder's coordination in disaster response, managing human behaviour and other response measures. At the end of semester, students should be able to answer how the response to natural as well as human-induced disasters should be and how progressively response strategies have improved in terms of effectiveness.

Credit-I

1. Response Essential Components
2. Disaster Response Plan
3. Communication, Participation and Activation of Emergency Preparedness Plans
4. Search, Rescue, Evacuation and Logistic Management
5. Needs and Damage Assessment

Credit-II

1. Stakeholders Co-ordination in Disaster Response
2. Central, State, District and Local Administration
3. Armed Forces in Disaster Response: Role and Responsibility
4. Community as First Responder
5. Role of NGO's

Credit-III

1. Psycho-social Response and Rehabilitation
2. Rumour and Panic Management and Role of Media
3 Medical and Health Response to Different Disasters
4. Role of Information, Communication and Technology (ICT)

Credit-IV

1. Relief Measures-Minimum Standards of Relief
2. Relief Management-Essential Components
3. Funding Relief –Short Term and Long Term
4. Disaster Site Management and Law & Order Issues

Suggested Readings

- Alfred Scott, 2016,Disaster Response and Emergency Management Hardcover, Syrawood Publishing House.
- Brain Tomaszewski, 2014, Geographic Information Systems (GIS) for Disaster Management, Routledge.
- IRS Guidelines by NDMA (Available at NDMA website)
- Miriam B. Kahn, 2012, Disaster Response and Planning for Libraries, Third Edition, ALA Editions.
- Nicolas A. Valcik and Paul E. Tracy, 2012, Case Studies in Disaster Response and Emergency Management, 2nd Edition, American Society for Public Administration.
- Purohit Jyoti, 2013, Disaster Management in India: Structure and Challenges, Lambert Publication.

REHABILITATION, RECONSTRUCTION AND RECOVERY DM17202CR

Course Outcome: This course aims to make students recognize important elements and distinguish the 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 how rehabilitation, reconstruction and recovery phase can be made efficient. Besides they will be familiar about one of the important aspects i.e. build-back-better approach.

Credit-I

1. Rehabilitation, Reconstruction and Recovery
2. Introduction to Short and Long Term Recovery Aspects
3. Community Participation in RRR (Rehabilitation, Reconstruction and Recovery)
4. Priorities in Recovery

Credit -II

1. Rehabilitation: Physical and Social Infrastructure
2. Relocation and Reconstruction of Housing
3. Public Buildings, Roads, Bridges, Dams
4. Archives and Monuments

Credit -III

1. Essential Services
2. Waste Management
3. Communication
4. Capacity Building for Self-Help Construction

Credit -IV

1. Social and Economic Rehabilitation
2. Capacity Building for Reconstruction under BBB (Build Back Better) Approach
3. Skill Enhancement for Livelihood Development
4. Training and Awareness Programs
5. Medical Aid Therapy and Counselling- Psycho-Social Issues

Suggested Readings

- F.Y. Cheng and Y.Y. Wang, 1996, Post-Earthquake Rehabilitation and Reconstruction
- Rajdeep Dasgupta, 2007, Disaster Management and Rehabilitation.
- David A. McEntire, 2014, Disaster Response and Recovery: Strategies and Tactics for Resilience, Wiley Publications.

GEOINFORMATICS FOR DISASTER MANAGEMENT DM17203CR

Course Outcome: Modern technologies such as Remote Sensing, GIS and GPS play a significant role in disaster management. The said course highlights all the domains with respect to the application of Geo-informatics in disaster management. In this course students will get hands-on experience on how the analysis of satellite data and GIS could help in retrieving essential information for disaster risk reduction. Damage and loss assessment associated with a particular disaster; and mapping pre and post disaster scenarios would also be covered.

Credit-I

1. Use of Earth Observation Data and Field Data for GIS-Database Development
2. GIS Architecture for Disaster Management

Credit-II

1. HRV Analysis:
   a. Hazard
   b. Risk
   c. Vulnerability

Credit-III

1. Damage and Loss Assessment (DaLA)

Credit-IV:

1. Geoinformatics Aided Disaster Mitigation: Hazards Zonation, Monitoring, Mapping and Visualization of Pre and Post Disaster Scenarios.

Suggested Readings:

- Leonard James Fendel, 2006, Comprehensive Disaster Management and Development
- NIDM, Geoinformatics for Disaster Management, www.nidm.gov.in
- Peter van Oosterom, Siyka Zlatanova, and Elfriede Huggins, 2007, Geo-information for Disaster Management
- Rao, K V G, 2010, Geoinformatics For Disaster Management

INSTITUTIONAL STRUCTURE FOR DISASTER MANAGEMENT DM17204DCE

Course Outcome: In this course the learners would get an understanding of the evolution, organizational structure, powers, and functions of the different international, national and local organizations for Disaster Management.

Credit-I

1. United Nations Development Programme (UNDP)
2. United Nations International Strategy for Disaster Risk Reduction (UNDP)
3. International Federation for Red Cross Societies (IFRCS)
4. Global Facility for Disaster Risk Reduction (GFDRR)
5. World Health Organization(WHO)

Credit-II

1. Asian Disaster Reduction Centre (ADRC)
2. Asian Disaster Preparedness Centre (ADPC).
3. SAARC Disaster Management Centre

Credit-III

1. National Disaster Management Authority
2. National Institute of Disaster Management
3. NITI Ayog
4. National Civil Defence Organization
5. National Platform for Disaster Risk Reduction

Credit-IV

1. J&K Disaster Management, Relief Rehabilitation and Reconstruction Department
2. State Disaster Management Authority
3. State Executive Committee
4. State Disaster Response Force
5. District Disaster Management Authority

Suggested Readings

- www.adpc.net
- www.gfdrr.org
- www.ifrc.org
- www.npc.gov.np
- www.ndma.gov.in
- www.nidm.gov.in
- www.in.undp.org
- www.who.int
- D.B.N. Murthy, 2007, Disaster Management: Text and Case Studies
- J&K Disaster Management, Relief Rehabilitation and Reconstruction Department jkadworld.com and http://jklaw.nic.in/pdf.
- Jack Pinkowski, 2008, Disaster Management Handbook
- National Platform for Disaster Risk Reduction nidm.gov.in/npdrr
- www.ndrfandcd.gov.in
- www.niti.gov.in
- Rajdeep Dasgupta, 2007, Disaster Management and Rehabilitation.
- www.unisdr.org

STATISTICAL TECHNIQUES FOR DISASTER MANAGEMENT DM17205DCE

Course Outcome: This course will introduce the students to statistical studies useful for analysis, understanding behavior and trends of hazards and disasters based on related statistics (historical data, statics on frequency, damage, loss, spatio-temporal patterns, etc.). Statistical analysis of data collected from the field through direct observations or from respondents (using designed questionnaires) regarding, vulnerability, hazards, disaster, and scenarios in any phase of disaster management are also contents of this course. This course will also familiarize the students about how to collect the data and how to identify factors impacting individuals and communities risk status.

Credit –I

1. Statistical Analysis in Disaster Management
2. Measures of Central Tendency
3. Measures of Dispersion
4. Measures of Skewness and Kurtosis
5. Quartile Deviation and Coefficient of Variation

Credit-II

1. Correlation: Types of Correlation
2. Karl Person's Coefficient of Correlation
3. Rank Correlation
4. Method of Concurrent Deviation

Credit-III

1. Regression Analysis, Coefficient of Regression
2. Linear Regression Equation, Least Square Method
3. Composite Index

Credit-IV

1. Sampling and its Types
2. Surveying for Damage Assessment

Suggested Readings

- B. L. Agarwal, 2006, Basic Statistics
- David Howell, 2010, Fundamental Statistics for the Behavioural Sciences
- M. G. Bulmer, 1979, Principles of Statistics
- Sheldon M. Ross, 2010, Introductory Statistics

DISASTER MANAGEMENT IN INDIA DM17206DCE

Course Outcome: The approach towards managing disasters has undergone a radical change over the last few decades. This course highlights the overall development of institutions dealing with disaster management in India. The course acquaints students about the roles, responsibility, and institutional structure of disaster management in India.

Credit-I

1. HPC 1999, Disaster Management Act 2005
2. Constitutional Power and Functions of Central Ministries (MHA, MoEF)
3. National Disaster Management Authority (NDMA), Central Ministries
4. National Disaster Response Force (NDRF) and National Crisis Management Committee (NCMC)
5. National Executive Committee (NEC) and Indian Meteorological Department (IMD)
6. National Institute of Disaster Management (NIDM)

Credit - II

1. National Agencies for Forecasting and Early Warning:
    i. IMD
    ii. ISRO
    iii. NRSC
    iv. WIRS
    v. GSI

Suggested Readings

- Govt. of India, 2004, Disaster Management in India, A Status Report. National Disaster Management Division, Ministry of Home Affairs,.
- GSI www.gsi.gov.in
- IMDwww.imd.gov.in
- ISRO www.isro.gov.in
- Mathur, G.C. 1986, Housing in Disaster prone areas, National Building Organization and U.N. Regional Centre. ESCAP, New Delhi.
- Mishra, P.K. 2004, Transforming Adversity into Opportunity: Experiences from Gujarat Earthquake Reconstruction Program World Congress on Natural disaster mitigation proceedings
- National Disaster Response Plan, NCDM, New Delhi, 2001.
- NRSC, www.nrsc.gov.in
- Sharma, Vinod K. 1994, Disaster Management, NCDM, IIPA, New Delhi.
- Taori, K , 2005, Disaster Management through Panchayati Raj, Concept Publishing Company, New Delhi
- WIRS,www.lr.org
- World Institution Building Programme Centre, 2004, Contemporary Natural and Manmade Disaster. Master of Disaster Mitigation.

WASTE AND DEBRIS MANAGEMENT DM17207DCE

Course Outcome: The objective of this course is to provide students knowledge about the generation, removal, and disposal of debris and waste following a major disaster. At the end of course, students should be able to know how to handle and dispose the hazardous and non-hazardous debris and waste.

Credit -I

1. Hazard Debris: Sources and Types
2. Debris and Waste Management – Need and Significance
3. Factors Affecting Debris Management
4. Disaster Debris Management Strategies/Disaster Debris Management Cycle
5. Disaster Debris Prevention Strategies

Credit -II

1. EPA's Guidelines for Disaster Waste Management Plan
2. Temporary Debris Management Areas (TDMA's)
3. Identifying Debris Management Sites (Ownership, Size, Location, Environmental and Historic Preservation Concerns)
4. Connecticut's Concept of Operations Plan (ConOps) for Disaster Debris Management.
5. Future Challenges of Debris management

Suggested Readings

- Bandara, and Hettiaratchi, 2010, Environmental impacts with waste disposal practices in a suburban municipality in Sri Lanka, Inderscience Publishers.
- Biomedical Waste (Management and Handling) Rules, 1998.
- D. Bhide and B.B. Sundaresan, 2001, "Solid Waste Management – Collection, Processing and disposal" Mudrashilpa Offset Printers, Nagpur.
- Hanrahan, D., S. Srivastava, and A. Ramakrishna, 2005, Municipal Solid Waste in India — Overview and Challenges, World Bank Environment Unit South Asia Region.
- J. Glynn Henry and Gary. W. Heinke, 2004, "Environmental Science and Engineering", Prentice Hall of India.
- UN-Habitat, Solid Waste Management in the World's Cities, 2009.

GEO-SPATIAL TOOLS FOR DISASTER MANAGEMENT DM17208GE

Course Outcome: Modern technologies such as Remote Sensing, GIS and GPS play an important role in disaster management. The said course highlights all the domains with respect to the application of Geo-informatics in disaster management. In this course students will get hands-on training about the use of satellite data, GIS and GPS in retrieve essential information for disaster risk reduction. Damage and loss assessment associated with a particular disaster and mapping pre and post disaster scenarios would also be covered.

Credit-I

1. Use of Earth Observation Data and Field Data for GIS-Database Development
2. GIS Architecture for Disaster Management
3. Damage and Loss Assessment (DaLA)

Credit-II

1. Data integration
2. Hazard Zonation, vulnerability Mapping, Risk Analysis
3. Visualization of Pre and Post Disaster scenarios

Suggested Readings

- Leonard James Fendel, 2006, Comprehensive Disaster Management and Development
- NIDM, Geoinformatics for Disaster Management, www.nidm.gov.in
- Peter van Oosterom, Siyka Zlatanova, and Elfriede Huggins, 2007, Geo-information for Disaster Management
- Rao, K V G, 2010, Geoinformatics for Disaster Management

DISASTER PROFILE OF INDIA DM17209GE

Course Outcome: India's unique geo-climatic position makes India particularly exposed to many hazards and the socio-economic structure makes it vulnerable too; the combination often becomes a cause of disasters. The spatio-temporal variability of India with respect hazards, vulnerability, exposure, and risk would be covered in this course. The paper will also illustrate the causes and consequences of historical disasters in India.

Credit-I

1. Historical Overview of Earthquake in India
2. Earthquake: Distribution and Zonation
4. Landslides: Implications and Zonation in Northern India
5. Floods/ Flash Floods

Credit-II

1. Cloudburst- Causes and Consequences
2. Cyclone and Tsunami Vulnerability Scenario of India
3. Chemical Biological Radiological and Nuclear (CBRN) Disasters
4. Road Accidents and Building Collapses

Suggested Readings

- Barua, A.K, 2005, Climatology, Dominant Publishers and Distributors.
- Bryant Edwards, 2005. Natural Hazard, Cambridge University Press.
- Edward A. Keller and Robert .H. Blodgett, 2008, Natural Hazards, Pearson Prentice Hall.
- Edward Aguada and J. E. Brat., 2016, Understanding Weather and Climate, Pearson International.
- G. K. Gosh, Disaster Management, A.P.H Publishers, New Delhi
- H.K. Gupta. 2003, Disaster management, 2003.
- Houghton, J.T., 2015, Global Warming: A Complete Briefing (5th Ed.), Cambridge University Press, 2015. .
- NIDM, Geological Hazards, www.nidm.gov.in
- Paneersalvam, S.K., 2012, Global Warming and Climate Change, A.H.P Publishing Co.
- Rajesh K Yadav*et. al*. Encyclopaedia of Disaster and Hazards Management, Oxford Book Company,
- Singh, K.K., Lotfi, Aleya and Singh, V., Disaster Management of Manmade Disasters, Motilal Banarsidass Publishers Private Limited.

GLOBAL POSITIONING SYSTEM (GPS) DM17210OE

Course Outcome: GPS providing exact location information has been used in varied fields. The technology is also useful in all phases of disaster management. This course will help the students to know the fundamentals, segments, positioning mechanism, and application of GPS.

Credit-I

1. Introduction to GPS
2. Segments of GPS
3. Positioning Mechanism
4. Sources of Errors
5. Limitations

Credit-II

Applications of GPS in:

1. Land Surveying
2. Navigation
3. Geology

Suggested Readings

- Jensen, R., 2007. Fundamentals of Remote Sensing, Shree Maître Print Tech Pvt. Limited Noida.
- Leick. A., 2003, GPS Satellite Surveying (2nd ed.), John Wiley and Sons, New York.
- N. K. Agarwal., 2004, Essentials of GPS, Spatial Network Pvt. Ltd, 2004.
- Panda C., 2008, Remote Sensing- Principles and Applications, Viva Books.
- Sahu, K.C., 2008, Textbook of Remote Sensing and Geographic Information System, Atlantic Publishers and Distributors.
- Singh, G., 2000, Map World and Practical Geography, Vikas Publishing House.

FLOOD SAFETY AND RESPONSE DM17211OE

Course Outcome: Floods account for largest share of all the disasters around the globe. About 12 percent of the country is exposed to periodic floods. In this course learners would be get deliberations on causes, types, effects, and mitigation and response strategies for the flood hazard.

Credit-I

1. Understanding Flood hazard
2. Types, Causes and Characteristics of floods
3. Flood Mitigation and Preparedness
4. Flood Crisis Management

Credit-I

1. Search and Rescue in Floods
2. Community as a First Respondent to Floods
3. Flood Safety Measures (During and After)
4. Role of Media in Rescue (Radio, Social Media etc.)

Suggested Readings

- A. Vogelbacher, 2013,Flood Disaster Risk Management - Hydrological Forecasts - Requirements and Best Practices: Training Module.
- Basic Search & Rescue Skills Emergency Response International, www.eri-online.com
- Flood Safety (http://www.geohaz.in/flood-safety/)
- Kevin Sene, 2008, Flood Warning, Forecasting and Emergency Response, Springer Publications.
- NIDM, Hydro-meteorological Hazards, www.nidm.gov.in

.

Semester-III

M.A./ M.Sc. Disaster Management Study Course Structure

Category	*Course Code*	*Course Title*	*Hours Per Week*			*Credits*
			Lecture	*Tutorial*	*Practical*	
Core	**DM17301CR**	Vulnerability Assessment	4	2	0	4
	DM17302CR	Disaster Risk Assessment	4	2	0	4
	DM17303CR	Field Training for Disaster Management	0	0	8	4
Discipline Centric Elective	**DM17304DCE**	DRR and Development Planning	2	2	0	2
	DM17305DCE	Hydrology and Hydro-meteorological Hazards	2	2	0	2
	DM17306DCE	Climate Change	2	2	0	2
	DM17307DCE	Disaster Sensitive Land Use Planning	2	2	0	2
	DM17308DCE	Research Methods in Disaster Management	2	2	0	2
Generic Elective	**DM17309GE**	Geomorphology	2	1	0	2
	DM173010GE	Disaster Prevention	2	1	0	2
Open Elective	**DM17311OE**	Emergency Response	2	1	0	2
	DM17312OE	Forecasting and Early Warning Systems	2	1	0	2
Total Contact Hours: 50 Per Week			**Total Credits: 30**			

VULNERABILITY ASSESSMENT DM17301CR

Course Outcome: This course aims to deliberate on various physical, social, economic, and environmental aspects of vulnerability. The learners are expected to have an understanding of the vulnerability concept and various approaches of vulnerability assessment.

Credit-I

1. Vulnerability: Definition and Concept
2. Observation and Perception of Vulnerability
3. Vulnerability: Types and Dimensions

Credit-II

1. Vulnerability Analysis
2. Indicators of Vulnerability
3. Vulnerability Assessment Methods
4. Pressure and Release (PAR) Model

Credit-III

1. Spatio-temporal Dynamics of Vulnerability
2. Vulnerability Mapping
3. Vulnerability of Towns and Cities
4. Vulnerability of Shanty Settlements
5. Initiatives of Risk and Vulnerability Reduction in India

Credit-IV

1. Planning for Vulnerability Reduction
2. Development and Vulnerability
3. Interactive Areas for Vulnerability Reductions and Policy Making
4. Vulnerability Status of India

Suggested Readings

- Birkmann, 2007, Measuring Vulnerability to Natural Hazards.
- David Etkinand Chowdhury Emdadul Haque, 2012, Disaster Risk and Vulnerability
- Greg Bankoff and Georg Frerks, 2013, Mapping Vulnerability: Disasters, Development and People.

DISASTER RISK ASSESSMENT DM17302CR

Course Outcome: Risk assessment is an area of direct importance for disaster risk reduction. During this course students will get awareness about the important components (hazard, vulnerability, and exposure) of disaster risk assessment. Moreover, the important concepts and approaches in disaster risk assessment process will also be included. This course will help the students in knowing about the current status, gaps and challenges in disaster risk assessment.

Credit-I

1. Concept of Disaster Risk and Risk Assessment
2. Inter-relationship between Hazard, Vulnerability and Disaster Risk
3. Disaster Risk Situation of India with Special Reference to Jammu and Kashmir
4. UNDP Approach for Comprehensive Risk Assessment

Credit-II

1. Basic Methodology in Risk Assessment
2. Risk Analysis -Concept and Techniques
3. Hazard Assessment Process
4. Concepts of Risk Evaluation and Risk Treatment

Credit-III

1. Current Status and Gap Analysis in Risk Assessment in Context of India
2. Guidelines for Mainstreaming Disaster Risk Assessment in Development in India
3. Utilization of Risk Assessment for DRR
4. Damage and Loss Assessment (DaLA)
5. Post Disaster Needs Assessments (PDNA)

Credit-IV

1. Risk Data and Information Collection
2. Concept of Risk Management
3 Design of Risk Management; Components and Areas of Action
4. Risk Profiling-Risk Matrix, Risk Curve, Factsheets, Risk map
5. Tools for Risk Assessment

Suggested Readings

- Pardeep Sahni and Madhavi Malalgoda Ariyabandu, 2003, Disaster Risk Reduction in South Asia.
- Rajib Shaw, 2012, Community-Based Disaster Risk Reduction,
- Reinhard Mechler, 2004, Natural Disaster Risk Management and Financing Disaster.
- Stephan Baas, 2008,DisasterRiskManagement Systems Analysis: A Guide Book.

FIELD TRAINING FOR DISASTER MANAGEMENT DM17303CR

Course Outcome: Students will be taken to field and exposed to socio-economic and geo-physical environment of any region, so that they are able to evaluate the different dimensions of vulnerability, exposure, and risk. The students will also get familiar with the important aspects which shall be kept in mind while preparing disaster management plan of any region. Pertinently, in the field studies course each student shall have to prepare a brief field report according to the nature and purpose of the field.

Credit-I

1. **Activities**- Preparation of Field Visit Plan
2. Application of Spatial Tools
3. Validation and Interpretation of Satellite Data in the Field
4. GPS Field Data Collection and Mapping

Credit-II

1. **Activities**- Identification and Interpretation of Geological Structures and Major Geomorphic Features in the Field
2. Interpretation of Landslide Surface Morphology
3. Visit to Flood Prone Areas and Inundation Assessment
4. Field Evaluation of Environmental Factors Responsible for Snow Avalanche Occurrence

Credit-III

1. **Activities**- Questionnaire Designing
2. Collection of Socio-Economic Data in the Field
3. Collection of Data Pertaining to Vulnerability and Hazards.

Credit- IV

1. Preparation of Disaster Management Plan

Suggested Readings

- David Lambert, 2007, The Field Guide to Geology,
- Enrico L. Quarantelli, and Russell Dynes, 2007, Handbook of Disaster Research, Havidan Rodriguez,
- Robert A. Stallings, 2003, Methods of Disaster Research.

DISASTER RISK REDUCTION AND DEVELOPMENT PLANNING DM17304DCE

Course Outcome: This course covers important features of disaster risk reduction and development planning. The learners are expected get understanding of how a planned development can minimize the losses associated with disasters.

Credit - I

1. Concept and Objectives of DRR
2. Developmental Strategies for DRR
3. DRR Initiatives at International and National Level
4. International Mobilization of Risk Reduction
5. Sustainable Development and DRR

Credit - II

1. Concept of Developmental Planning
2. Disaster-Development Relationship
3. Developmental Planning in Context of DRR
4. Developmental Planning in Relation to Capacity and Vulnerability.
5. Application of IT and RS in DRR
6. DRR through IEC (Information, Education and Communication)

Suggested Readings

- Andrew E. Colins, 2009, Disaster and Development, Routledge.
- Jack Pinkowski, 2008, Disaster Management Handbook.
- Mark Pelling, 2003, Natural Disaster and Development in a Global World, Routledge.
- Misanya Doreau, 2011, Disaster and Development, VDM Variag Publishers.
- Nancy Rushford and Kerry Thomas, 2015, Disaster and Development: An Occupational Perspective, Churchill Livingstone.
- Pardeep Sahni, 2003, Disaster Risk Reduction in South Asia, Prentice Hall of India, New Delhi.
- Rajdeep Dasgupta, 2007, Disaster Management and Rehabilitation.
- Rajib Shaw, 2012, Community Based Disaster Risk Reduction.

HYDROLOGY AND HYDRO-METEOROLOGICAL HAZARDS DM17305DCE

Course Outcome: In this course the students will be acquainted with the different concepts of hydrology and meteorology and associated factors which cause a wide range of hydro-meteorological hazards such as floods, droughts etc.

Credit-1

1. Hydrology- Meaning and Scope
2. Global hydrological cycle/budget
3. Hydrographs- Types, Factors affecting hydrographs
4. Groundwater Level, Soil Saturation, and Surface Flow

Credit-1I

1. Watershed and drainage basin
2. Channel morphology-Controls on flood occurrence
3. Floods as hydro-meteorological hazard
4. Measureable features of flood- Unit Hydrograph, Flood Frequency, Base flow separation

Suggested Readings

- Fundamentals of Hydrology Tim Davie (2008).Taylor & Francis.
- Hydrology: Principles and Processes (2017) M. Robinson, R. C. Ward IWA Publishing.
- Global Hydrology: Processes, Resources and Environmental Management. J. A. A. Jones, (2014). Routledge
- Floods: Physical Processes and Human Impacts. Keith Smith, Roy Ward (1998). Wiley.

CLIMATE CHANGE DM17306DCE

Course Outcome: Climate change being the most challenging natural process of the present day, the course has been introduced to enable students to get insights about the changing nature of the earth's climate, the causative and controlling factors. The course also covers the policy frameworks, mitigation and adaptation strategies for the climate change.

Credit-I

1. History of earth's climate
2. Temperature and precipitation trends
3. Carbon cycle: Greenhouse Effect, carbon stocks and flows
4. El Niño–Southern Oscillation (ENSO)
5. Simulations models (GCM/RCM): projections and uncertainties

Credit-II

1. Extreme weather events
2. Climate change and biosphere
3. Climate Change adaptation and mitigation
4. Economics of climate change
5. Climate Change Policy Framework

Suggested readings

- James Rodger Fleming (1998). Historical Perspectives on Climate Change. Oxford University Press
- Mark Maslin (2014). Climate Change: A Very Short Introduction. Oxford University Press.
- William Kininmonth (2004). Climate Change: A Natural Hazard. Multi-science Publishing co. Ltd.
- Cambridge University (2013). Climate Change: Action, Trends and Implications for Business.
- IISD, UNITAR & UNEP (2009). IEA Training Material: Vulnerability and Climate Change Impact Assessment for Adaptation.
- IPCC (2013). Climate Change 2013. The Physical Science Basis - Summary for Policymakers.
- OECD (2009): Guidance on Integrating Climate Change Adaptation into Development Co-operation.
- UNEP (2009). Climate Change Science Compendium
- UNEP (2009). Climate in Peril, a Popular Guide to the Latest IPCC Report.
- UNEP & UNDP (2011). Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners.

DISASTER SENSITIVE LAND USE PLANNING DM17307DCE

Course Outcome: Human practices have increased the risk and vulnerability towards disasters by many folds. Improper land use planning is the primary factors influencing exposure and vulnerability of communities. The course covers the important characteristics of land use planning and factors governing the land use change. Besides in this course students will get familiar with different legal provisions of India with regard to land use regulations.

Credit-I

1. Land Use Planning in Relation to Disasters - Concept and Objectives
2. Land Use Planning Techniques and Methods
3. Basic Principles of Land Use Planning
4. Land Use Planning in India and Legal Provisions

Credit-II

1. Concept of Land and Land Use
2. Factors Governing Land Utilization
3. Drivers of Land Use Changes
4. Land Use Zoning, Land Suitability and Land Sensitivity
5. Rural and Urban Land Use Planning

Suggested Readings

- Edward S. Kaiser and F. Stuart Chapin, 1957, Urban Land Use Planning, 4th Edition.
- Hok-Lin Leung, 2003, Land Use Planning Made Plain, University of Toronto Press.
- Jane Silberstein, M.A., and Chris Maser, 2013, Land-Use Planning for Sustainable Development, Second Edition, CRC Press.
- John Randolph, 2004, Environmental Land Use Planning and Management.
- Julian Conrad Juergensmeyer and Thomas E Roberts, 2003, Land Use Planning and Development Regulation Law, Thomas West.
- Philip R. Berke, David R Godschalk, 2006, Urban Land Use Planning, 5th Ed., University of Illinois Press.
- T. William Patterson, 1979, Land Use Planning, Techniques of Implementation, Van Nostrand Reinhold Company.

RESEARCH METHODS IN DISASTER MANAGEMENT DM17308DCE

Course Outcome: Considering the broad scope for research in disaster management and its importance as a means of disaster mitigation and preparedness, this course covers different input data sets and methods for disaster research. This course will enhance the skills of the students to tackle the research works as well.

Credit-I

1. The Research Process –Broad Problem Area, Preliminary Data Collection, Problem Selection
2. Theoretical Framework– Research Questions, Hypothesis Development, Elements of Research Design.
3. Experimental Design –Laboratory Experiment, Variables, Validity, Types of Experimental Designs

Credit-II

1. Sampling Methods
2. Data Collection –Sources and Methods
3. Data Processing and Analysis
4. Hypothesis Testing, Sampling Designs

Suggested Readings

- Robert A. Stallings, 2003, Methods of Disaster Research.

GEOMORPHOLOGY DM17309GE

Course Outcome: The course has been designed to provide learners an understanding of fundamental principles in geomorphology. The course includes looking at evolution and dynamics of landforms in relation to various exogenic and endogenic processes.

Credit-I

1. Fundamental Concepts in Geomorphology
2. Concept of Landform Evolution
3. Principles of Uniformitarianism
4. Cycles of Erosion - Concepts of Davis and Penck

Credit-II

1. Exogenic Processes- Weathering and Erosion
2. Fluvial Process and Resultant Landforms
3. Glacial Process and Resultant Landforms
4. Dynamics of Aeolian Process and Resultant Landforms

Suggested Readings

- Alan Clowes and Comfort, 1987, Processes and Landforms.
- Bloom, A.L., 2003, Geomorphology-A systematic Analysis of Late Cenozoic Landforms.
- Steers, J.A., 1983, Unstable Earth: Some recent views in Geomorphology.
- Strahler, A.H. &Strahler, A.H., 199, Elements of Physical Geography.
- Thornbury, W.D., 2004, Principles of Geomorphology, Second Edition.

DISASTER PREVENTION DM17310GE

Course Outcome: In this course the students will be familiarized with, how capacity building is essential for disaster prevention and mitigation. How technological driven initiatives and community based approach help in disaster prevention are also part? Besides, this course covers the important facets of disaster awareness and early warning systems.

Credit - I

1. Capacity Building
2. Mass Awareness
3. Forecasting and Early Warning Systems

Credit - II

1. Technology Driven Initiatives
2. Land Use Planning
3. Community Based Disaster Risk Reduction

Suggested Readings

- Chang Zinha Zommers and Ashkinda Singh, 2014, Reducing Disaster Early Warning System for China, Springer.
- Indian Tsunami Early Warning System www.tsunami.incois.gov.in
- Jane Silberstein, M.A., and Chris Maser, 2013, Land-Use Planning for Sustainable Development, Second Edition, CRC.
- John Randolph, 2004, Environmental Land Use Planning and Management.
- Julian Conrad Juergensmeyer and Thomas E Roberts,2003, Land Use Planning and Development Regulation Law, Thomas West.
- Kenjy Satake *etal*, 2012, Tsunami in the World Ocean Past Present and Future, Birkhouse.
- www.ndma.gov.in
- www.nidm.gov.in
- www.undp.org

EMERGENCY RESPONSE DM17311OE

Course Outcome: The prompt and efficient response to disasters can save lives and reduce the overall adverse impact of disasters. This course highlights the essential components of emergency response suitable for on time action in during different extreme events such as earthquakes, floods etc.

Credit-I

1. Incident Response System(IRS) - Development
2. Features of Incident Response System
3. Incident Response Organisational Setup
4. Incident Recourse Management

Credit-II

1. Emergency Response to Fire Hazard
2. Emergency Response to Flood Hazard
3. Emergency Response to Chemical Hazard
4. Emergency Response to Road/ Rail Accident

Suggested Readings

- Adam S. Crowe, 2016, A Futurist's Guide to Emergency Management, Springer Publications.
- Gian Paolo Cimellaro, 2016, Urban Resilience for Emergency Response and Recovery, Springer Publications.
- Kevin Sene, 2008, Flood Warning, Forecasting and Emergency Response, Springer Publications.
- NIDM, IRS Module, New Delhi.
- United States Department of Transportation, 2016, Emergency Response Guide Book, Transport Canada, Secretariat of Communications and Transportation.

FORECASTING AND EARLY WARNING SYSTEMS DM17312OE

Course Outcome: Early warning systems and forecasting has been given credit for preventing and reducing the disaster loss across the globe. In this course the students will get thorough knowledge about the important early warning and forecasting systems and prediction approaches for different natural hazards.

Credit-I

1. Weather Forecasting
2. Flood Forecasting
3. Landslide Warning
4. Snow-Avalanche Warning

Credit-II

1. Cyclone Early Warning Systems
2. Tsunami Early Warning Systems
3. Volcanic Eruption Prediction
4. Earthquake Prediction

Suggested Readings

- Chang Zinha Zommers Ashkinda Singh, 2014, Reducing Disaster Early Warning System for China, Springer .
- Cyclone monitoring www.nidm.gov.in
- Cyclone warning www.imd.gov.in
- Disaster geo www.nidm.gov.in
- Disaster hymet www.nidm.gov.in
- Earthquake prediction www.world-earthquakes.com
- Indian Tsunami Early Warning System www.tsunami.incois.gov.in
- Kenjy Satake et al, 2012, Tsunami in the World Ocean Past Present and Future, Birkhouse
- Predicting volcanic eruptions www.volcanoworld.wordpress.com
- Warning system for landslides www.eos.org
- Weather forecasting www.imdpune.gov.in

Semester-IV

M.A./ M.Sc. Disaster Management Study Course Structure

Category	*Course Code*	*Course Title*	*Hours Per Week*			*Credits*
			Lecture	*Tutorial*	*Practical*	
Core	**DM17401CR**	Crisis Management and Incident Response System	4	2	0	4
	DM17402CR	Disaster Management Initiatives and Legal Provisions	4	2	0	4
	DM17403CR	Project Work/Dissertation	4	0	4	4
Discipline Centric Elective	**DM17404DCE**	Conflicts and Geo-Political Issues in Disaster Management	4	2	0	4
	DM17405DCE	Emergency Medicine	2	2	0	2
	DM17406DCE	Environmental Impact Assessment and Environmental Management Programme	2	2	0	2
	DM17407DCE	Drug Abuse and Human Trafficking	2	1	0	2
Generic Elective	**DM17408GE**	Climatology	2	1	0	2
	DM17409GE	Disaster Management	2	1	0	2
Open Elective	**DM17410OE**	Disaster Management for Critical Infrastructure	2	1	0	2
	DM17411OE	Search and Rescue Operations	2	1	0	2
Total Contact Hours: 49			**Total Credits: 30**			

CRISIS MANAGEMENT AND INCIDENT RESPONSE SYSTEM DM17401CR

Course Outcome: The course has been designed to give learners knowledge of the structure and functioning of crisis management and incident response system. The students will also be familiarized with the role of international and national emergency management teams to handle crisis and incident response system in India.

Credit-I

1. Crisis: Concept and Types
2. Crisis Management: Concept and Objectives
3. Impact of ICT on Crisis Management
4. Identifying Potential Crisis Situations

Credit II

1. Crisis Management Preparedness
2. Training and Testing
3. Crisis Communication
4. Crisis Operational Guidelines
5. Role of Social Media in Crisis Preparedness

Credit III

1. Disaster Recovery Planning
2. National and International Disaster Recovery Policies
3. Economy and Essential Services Management in Emergencies
4. Media Management in Crisis
5. Emergency Management Teams

Credit IV

1. IRS – Concept, Development and Features
2. IRS – Organization
3. IRS – Guidelines
4. Incident Resources and Resources Management
5. Preparing a Crisis Management Plan

Suggested Readings:

- Arnold M. Howitt and Herman B. Leonard, 2009, Managing Crisis: Response to Large Scale Emergencies.
- Edward S. Devlin, 2006, Crisis Management Planning and Execution.
- George E. Doherty, 2013, Crisis Intervention Training for Disaster Workers: An Introduction.
- Harvard Business Essentials, 2011, Crisis Management - Master the Skills to Prevent Disasters.
- Jamie Watters, 2014, Disaster Recovery, Crisis Response, and Business Continuity: A Management Desk Reference, IPress.
- Judy Larkin and Michael Regester, 2008, Risk Issues and Crisis Management in Public Relations.
- NIDM, 2015, Training Module Incident Response System, Basic and Intermediate.
- Steven Fink, 2002, Crisis Management: Planning for the Inevitable, IUniverse.
- Suresh Goel, 2009, Crisis Management: master the Skill to Prevent Disasters.
- Tiwari Asmita, 2015, The Capacity Crisis in Disaster Risk Management, Springer Publications.

DISASTER MANAGEMNET INITIATIVES & LEGAL PROVISIONS DM17402CR

Course Outcome: This course is aimed to provide students an in-depth knowledge about the various humanitarian, institutional and legal initiatives taken to mitigate disasters at global, national and local level.

Credit-I

1. Recent Initiatives on Disaster Management by UNO
2. Yokohama, Hyogo and Sendai Framework for Action on Disaster Risk Reduction
3. Disaster Initiatives in India in Context of DM Act 2005
4. International Disaster Response Laws, Rules & Principles (IDRL).

Credit-II

1. International Health Regulations (2005).
2. Nuclear Accident Convention (1986).
3. Tampere Convention (1998).
4. Convention on Oil Pollution (1990).

Credit-III

1. The Water (Prevention and Control of Pollution) Act, 1974
2. Dam Safety Bill 2010.
3. National Building Code of India (2005).
4. National Disaster Management Act 2005 and National Disaster Management Plan 2016

Credit-IV

1. J&K Disaster Management, Relief Rehabilitation and Reconstruction Department
2. The Jammu and Kashmir Natural Calamities Destroyed Areas Improvement Act, 1955
2. J & K Pollution Control Board.
3. Jammu and Kashmir Water Resources (Regulation and Management Act 2010)
4. Jammu and Kashmir Forest Act, 1987

Suggested Readings

- George R. Ciottone, 2006, Disaster Medicine.
- H.K. Gupta, 2003, Disaster management
- https://www.iaea.org
- https://www.jk.gov.in
- Jammu and Kashmir Disaster Management Department jklaw.nic.in
- Jammu Kashmir Forest act www.jkdears.com
- JK Pollution Control Board jkspcb.nic.in
- jkswrra.nic.in/act.pdf
- Michael Regester, and Judy Larkin, 2008, Risk Issues and Crisis Management in Public Relations: A..
- National Building Code bis.org.in
- World Disaster Conferences https://en.wikipedia.org
- www.iaru.org
- www.ifrc.org
- www.imo.org
- www.moef.nic.in
- www.ndma.gov.in
- www.nidm.gov.in
- www.unisdr.org

PROJECT WORK/DISSERTATION DM 17403CR

Course Outcome: This course involves components for preparation of dissertation by concerned students on any of the topics relevant to disaster management theme selected in consultation with the concerned supervisor (teacher).

Credits: 04

Credit-I carrying 25 percent marks would involve teaching (lectures) on components and preparation of dissertation by concerned teachers. Credit-II, III, and IV carrying 75 percent marks of the course would be for the preparation of dissertation on any of the topics relevant to disaster management, selected in consultation with the concerned Supervisor/Guide. The structure of the dissertation is highlighted in Credit-I.

Credit-I

1. Statement of the Problem
2. Conceptual Framework
3. Objectives
4. Hypothesis/ Research Questions
5. Literature Survey
6. Methodology
7. Data Sources (Based on Primary Sources, Secondary Sources and Laboratory Work)
8. Results and Discussion
9. Conclusion
10. References

Credit-II, III, and IV

Dissertation

CONFLICTS AND GEO-POLITICAL ISSUES IN DISASTER MANAGEMENT DM17404DCE

Course Outcome: This course is aimed at providing comprehensive knowledge about the conflicts and geo-political issues that are related to disaster management e.g. the trans-boundary disasters and their management. Besides the refugee crisis and the role and mandate of various global and regional organizations in Geo-political conflicts will also be dealt in the course.

Credit-I

1. Trans-Boundary Disasters and their Management
2. Concept of Uni-Polar and Bi-Polar World
3. Buffer Zones: Evolution and Dynamics
4. Boundary Disputes in South Asia and West Asia

Credit-II

1. Conflicts and their Implications on People and their Economy: Case Studies of
   a. Vietnam
   b. Afghanistan
   c. Gulf

Credit-III

2. Refugee Crisis and their Implication; Case Studies of:
   a. South Asia
   b. West Africa
   c. Central Africa

Credit-IV

1. Role and Mandate of UNHCR, UNICEF, ICRC in Geo-political Conflicts
2. Post-Independence Conflict between India-Pakistan
3. Economic and Life losses from the India-Pakistan conflict
4. India-Pakistan conflict and Development Constraints for SAARC Countries

Suggested Readings

- Colin Flint, 2012, Introduction to Geopolitics.
- Amos N. Guiora, 2013, Modern Geopolitics and Security: Strategies for Unwinnable.
- Michael Don Ward, 1992. The New Geopolitics.

EMERGENCY MEDICINE DM17405DCE

Course Outcome: The course has been developed to make students aware about the application of medical and health disciplines for prevention, preparedness, response and recovery of health problems arising out of disasters. Besides the meaning and significance of disaster medicine, disaster site management, casualty area management, community health management, and application of ICT in health management of disasters will also be covered.

Credit-I

1. Understanding Emergency Medicine
2. Disaster Site Management
3. Mass Casualty Management
4. Triage- Concept and Use

Credit-II

1. Medical and Health Response to Different Disasters
2. Community Health Management During Disasters
3. Education and Training in Health Management During Disasters
4. Role of Information, Communication and Technology in Health Response

Suggested Readings

- Gregory R. Ciottone, 2006, Disaster Medicine,
- Singleton. R.A. Jr, and Straits B. C., 1999, Approaches to Social Research. Oxford University Press, New York.
- Vohra N.D., 2003, Quantitative Techniques in Management Tata McGraw Hill.

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME DM17406DCE

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

Credit-I

1. EIA: Concept, Objectives and Approaches
2. Baseline Data Generation and Strategic Environmental Assessment
3. EIA Guidelines 2006 and Legal Provisions
4. Protocol for Environment Impact Statements
4. Public Participation in Environmental Decision Making
5. National Policy for Resettlement and Rehabilitation (NPRR)

Credit-II

2. Methodologies of EIA: Quantification of Environmental Impact
3. Concept of Disaster-Environment Matrix
4. Matrices, Networks, Cost-benefit Analysis, Overlay Maps
5. EIA Report and its Contents
6. EIA Case Studies: Hydel Projects, Industrial Estates Highways
7. Ecological Assessment
8. 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.

DRUG ABUSE AND HUMAN TRAFFICKING DM17407DCE

Course Outcome: The epidemic of harmful substance consumption especially among young has assumed alarming dimensions worldwide. During this course the students will get to know about the international, national and local drug and narcotic scenarios and human trafficking in South and South West Asia.

Credit - I

1. Drugs and Narcotics: A Brief Introduction
2. Drug Addiction and Illegal Use of Substances: National and International Scenario
3. Causes and Consequences of Drug Addiction
4. Drug Addiction Scenario in India and J & K

Credit - II

1. Human Trafficking as a Social Hazard: Causes and Consequences, Case Study of South-Asia and South-west Asia with Special Reference to:

    a. Children
    b. Women

Suggested Reading

- Virginia M. Kendall, and T. Markus Funk, 2012, Child Exploitation and Trafficking.
- Louise Shelley (2010). Human Trafficking: A Global Perspective. Cambridge University Press.

CLIMATOLOGY DM17408GE

Course Outcome: The course is designed to provide learners an understanding of fundamental characteristics of weather and climate. Moreover, the course would cover other atmospheric phenomenon as well such as the impact of monsoon and western disturbances on the climate of India.

Credit-I

1. Meteorology and its Relation with Climatology
2. Evolution of Earth's Atmosphere- Structure and its Role
3. Heat Budget and Latitudinal Heat Balance
4. Pressure Belts - Global Circulation System
5. Climatic Classification, Koppen

Credit- II

1. Climatic Change and Climatic Variability – Evidences and Indicators
2. Climate of India & Its Controls
3. Western Disturbances - Nature and Significance
4. Classical Theory of Indian Monsoon
5. Modern Theory of Indian Monsoon

Suggested Readings

- Aguada, Edward & Brat, J. E., 2016, Understanding Weather and Climate, Pearson International.
- Barua, A.K., 2005, Climatology, Dominant Publishers and Distributors.
- Critchfield, H.,1975, General Climatology, Prentice Hall, NewYork.
- Grald, S., 1980, General Oceanography-An Introduction, John Wiley & Sons, New York.
- Houghton, J.T., 2015, Global Warming a Complete Briefing (5th Ed.), Cambridge University Press.
- Lutgen, Fedrick K., 2006, The Atmosphere: An introduction to Meteorology, Princeton Hall.
- Paneersalvam, S.K., 2012, Global warming and Climate Change, AHP Publishing Co.
- Stringer, E.T., 1982, Foundation of Climatology, Surjeet Publication, Delhi.
- Vega, Anthony J. and Rohil, Robert V., 2008, Climatology.

DISASTER MANAGEMENT DM17409GE

Course Outcome: The main aim of this course is to provide a comprehensive knowledge to the students on disaster preparedness, mitigation, rehabilitation, and recovery. It will also enable the students to know the role and responsibilities of various international, national and regional agencies in disaster management.

Credit-I

1. Natural and Human-Induced Disasters
2. Disaster Management Cycle
3. Disaster Management Act (2005)
4. Disaster Risk Assessment

Credit-II

1. Role of International Organizations in DM
2. Role of Government Agencies (Administration and Forces)
3. Role of NGO's
4. Community Based DM

Suggested Readings

- Donald Hyndman and David Hyndman, 2009, Natural Hazards and Disasters... Brooks/Cole.
- G. K. Gosh, Disaster Management, APH Publishers.
- NDMA website www.ndma.gov.in
- NIDM website www.nidm.gov.in
- Rajesh K. Yadav*et. al*. Encyclopedia of Disaster and Hazards Management, Oxford Book Company.

DISASTER MANAGEMENT FOR CRITICAL INFRASTRUCTURE DM17410OE

Course Outcome: This course enables students to know about critical infrastructure, disaster vulnerability of basic critical infrastructure and safety measures for critical infrastructure like hospitals, schools etc.

Credit- I

1. Concept of Critical Infrastructure
2. Classification of Critical Infrastructure
3. Disaster Vulnerability of Basic Critical Infrastructure

Credit-II

1. Disaster Risk Reduction/Safety Measures for the Following Basic critical infrastructure:-

    a) Hospitals
    b) School Buildings
    c) Power and Water Installations
    d) Transport and Communication Modes

Suggested Readings

- Bach C., A.K. Gupta, S.S. Nair and J. Birkmann, 2013, Critical Infrastructures and Disaster Risk Reduction. National Institute of Disaster Management and Deutsche Gesellschaftfür international Zusammenarbeit GmbH (GIZ), New Delhi.
- Critical Infrastructure https://www.nap.edu
- Hospital safety https://docs.google.com/forms
- O. P. Dutta, Safety and Disaster Management Methods, Techniques, Recent Approach, Major Events & Exist Framework Hazardous Material
- School Safety Initiatives by Geo-hazards Society http://www.geohaz.in/.

SEARCH AND RESCUE OPERATIONS DM17411OE

Course Outcome: Disasters in densely populated areas around the world have increased the need for search and rescue capabilities to assist trapped victims. The said course is thus aimed at enabling students understand search and rescue procedures during earthquakes, floods, snow avalanches, building fires/collapse.

Credit- I

1. Concept of Search and Rescue
2. Search and Rescue Teams and Equipment
3. Operational Methods
4. Search and Rescue at Community

Credit-II

Search and Rescue in Following Hazards,

1. Earthquakes
2. Floods
3. Snow Avalanches
4. Building Fires/Collapse

Suggested Readings

- 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