

<b>Programme: UG</b>		<b>Year: I</b>		<b>Semester: I</b>	
<b>Subject: Geography/ Geology</b>					
<b>Course Name: Disaster Management</b>					
<b>Course Code: MD-1</b>					
Course Type: <b>MD -1 (Theoretical)</b>		Course Details: <b>Multidisciplinary Course-1</b>		L-T-P: <b>3 - 0 - 0</b>	
Course Credit: <b>3</b>	Full Marks: <b>50</b>	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
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<p><b>Course Objectives:</b></p> <ul style="list-style-type: none"> <li>✧ This course has been framed with an intention to broaden the dimensions of disaster science education.</li> <li>✧ It is innovative and knowledge oriented to attract bright students to critically understand the strengths and weaknesses of disaster management approaches, planning, and programming in India.</li> </ul>					
<p><b>Learning Outcome:</b></p> <ul style="list-style-type: none"> <li>✧ Students will have in-depth knowledge about the different parameters during any disaster, which are critical to all life forms, especially humans, in a sustainable way.</li> <li>✧ Students will familiarize about the mitigation measures to prevent and mitigate different disasters.</li> </ul>					
<p><b>Professional Skill Development:</b></p> <ul style="list-style-type: none"> <li>✧ The students will definitely assist people regarding risk reduction from any disaster.</li> <li>✧ This knowledge will help to provide inputs on the basic concepts that underlie much of the United Nations Sustainable Development Goals on reducing the adverse effects of natural disasters.</li> </ul>					
<b>Sub units</b>	<b>Topics to be covered</b>				<b>No. of Lectures</b>
<b>Unit I: Basic Concepts and Management [20 Hours]</b>					
1.1	Basic concepts: Definition and types of hazard and disaster (Natural, quasi-natural and man-made); Vulnerability, Risk and Capacity; Cascading disasters and compound events				5
1.2	Disaster Risk Reduction (DRR) strategy: Pre-disaster, disaster and post-disaster phase - Preparedness, rehabilitation, reconstruction and recovery; Community-based DRR; National Disaster Management Guidelines and Disaster Management Act-2005				5
1.3	Global initiatives: SDG 11 - Target 5 (Reduce the adverse effect of natural disasters), Sendai Framework (DRR), Global Facility for Disaster Reduction and Recovery (GFDRR)				5
1.4	National initiatives: Role of institutional framework in disaster management (NDMA-SDMA-DDMA, NDRF, Civic volunteers, NIDM); Disaster Management Support by NRSC, ISRO Bhuvan Portal (Real-time GIS-based disaster database of India)				5
<b>Unit II: Disaster Specific Case Studies [25 Hours]</b>					

2.1	Earthquake: Factors, vulnerability, consequences and management. Tsunami: Factors, vulnerability and management; Role of Indian Tsunami Early Warning Centre (ITEWC); Case study of Indian Ocean Tsunami, 2004	7
2.2	Floods: Meteorological and Outburst Floods (GLOF, LLOF, Avalanche) - causes, consequences and management; Case study of Bengal's Millennium Flood, 2000. Drought: Meteorological, hydrological and agricultural droughts - factors, vulnerability and management	6
2.3	Landslide: Factors and vulnerability; Major problems and mitigation strategy for landslides in Himalayan region; Case study of Darjeeling landslides. Cyclone: Tropical cyclone and storm surge - factors, vulnerability and management	6
2.4	Mining disasters: Open cast and shaft mining - vulnerability and management; Case study of Asansol-Raniganj coalfield. Industrial disasters: Gas and radiation leaks, oil spills - vulnerability and management	6

#### ◇ Course Evaluation:

##### ● Continuous Assessment: 15 Marks

1. Project report: One Project Report is to be prepared and submitted based on any one case study among the above disasters from West Bengal, incorporating a preparedness plan. The report should be prepared on secondary data and handwritten on A4 page in candidates' own words, not exceeding 2,000 words excluding references. [10 Marks]

2. Viva-voce based on project report [5 Marks]

##### ● End Semester Examination: 35 Marks

The end semester examination shall be conducted based on written test.

**Question Pattern:** Students have to answer One questions carrying **10 marks** out of given **three** questions; Two questions carrying **5 marks** each out of given **five** questions; Five questions carrying **2 marks** each out of given **eight** questions; Five questions carrying **1 mark** each out of given **eight** questions.

#### ◇ References

##### **BOOKS:**

Central Water Commission (1987): Flood Atlas of India. CWC, New Delhi.

Central Water Commission (1989): Manual of Flood Forecasting. New Delhi.

Clague, J.J. and Stead, D. (Eds.) (2012): Landslides: Types, Mechanisms and Modeling. Cambridge University Press.

Coch, N.K. (1994): Geohazards: Natural and Human, Pearson College.

Dewan, A. (2013): Floods in a Megacity: Geospatial Techniques in Assessing Hazards, Risk and Vulnerability, Springer, Dordrecht.

Government of India (2008): Vulnerability Atlas of India, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.

Government of India (2011): Disaster Management in India, Ministry of Home Affairs, New Delhi.

Gupta, H.K. (2013): Disaster Management, University Press.

Kapur, A. (2010): Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.

Modh, S. (2010): Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.

NDMA (2009) National Policy on Disaster Management 2009. National Disaster Management Authority (NDMA), Ministry of Home Affairs, Government of India.

Nishith, R. and Singh, A.K. (2012): Disaster Management in India: Perspectives, Issues and Strategies. New Royal Book Company, Lucknow.

NITI Aayog (2021): Report of the Committee constituted for formulation of strategy for Flood Management Works in entire country and River Management Activities and works related to Border Areas (2021-26). National Institution for Transforming India, New Delhi.

Ramkumar, M. (2009): Geological Hazards: Causes, Consequences and Methods of Containment, New India Publishing Agency, New Delhi.

Singh, R.B. (2005): Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.

Singh, R.B. (ed.) (2006): Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.

Singh, S. and Singh, J. (2013): Disaster Management, Pravalika Publications, Allahabad.

Sinha, A. (2001): Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.

Smith, K. (2013): Environmental Hazards: Assessing Risk and Reducing Disaster, 6<sup>th</sup> ed, Routledge.

UNDRR (2020): Human Cost of Disasters. An Overview of the last 20 years (2000-2019). Centre for Research on the Epidemiology of Disasters (CRED), United Nations Office for Disaster Risk Reduction (UNDRR).

Wadge, G. (1994): Natural Hazards and Remote Sensing. Proceedings sponsored by the Natural Environment Research Council and National Remote Sensing Centre Limited.

**WEBSITES:**

Dartmouth Flood Observatory: [floodobservatory.colorado.edu](http://floodobservatory.colorado.edu)

USGS Earthquake Hazards Programme: [earthquake.usgs.gov](http://earthquake.usgs.gov)

India Meteorological Department Cyclone Page: [mausam.imd.gov.in/ind\\_latest/contents/cyclone.php](http://mausam.imd.gov.in/ind_latest/contents/cyclone.php)

India Universities and Institutions Network for Disaster Risk Reduction (IUIIN-DRR): [iuiin-drr.nidm.gov.in/Home](http://iuiin-drr.nidm.gov.in/Home)

National Disaster Management Authority (NDMA): [ndma.gov.in](http://ndma.gov.in)

ESSO-Indian National Centre for Ocean Information Services (INCOIS): [incois.gov.in](http://incois.gov.in)

International Centre for Integrated Mountain Development: [icimod.org](http://icimod.org)

National Center for Seismology: [seismo.gov.in](http://seismo.gov.in)

United Nations Office for Disaster Risk Reduction: [undrr.org](http://undrr.org)

Irrigation & Waterways Department, Government of West Bengal: [wbiwd.gov.in](http://wbiwd.gov.in)

Central Water Commission: [cwc.gov.in](http://cwc.gov.in)

Disaster Management Support Services, RSAA/NRSC/ISRO: [bhuvan-app1.nrsc.gov.in/bhuvandisaster](http://bhuvan-app1.nrsc.gov.in/bhuvandisaster)