

## TMS - 406: DISASTER MANAGEMENT

Credits: 3

### Course Objectives:

1. To provide students an understanding the need for studying the disaster management
2. Develop an understanding about the various types of disasters.
3. To expose students to the risk and vulnerability analysis
4. To create awareness about disaster prevention and risk reduction
5. To establish relationship between disasters and developments.
6. To understand Rehabilitation, Reconstruction and Recovery in the event of Disaster
7. To gain knowledge on Climate Change Adaptation and IPCC Scenario and Scenarios in the context of India.

### Course Outcomes:

- CO1:** Understand the need and significance of studying disaster management
- CO2:** Understand the different types of disasters and causes for disasters.
- CO3:** Gain knowledge on the impacts Disasters on environment and society
- CO4:** Study and assess vulnerability of a geographical area.
- CO5:** Students will be equipped with various methods of risk reduction measures and risk mitigation.
- CO6:** Understand the role of Information Technology in Disaster Management
- CO7:** Understand Geographical Information System applications in Disaster Management

**Pedagogy:** Lectures, seminars, group discussion, presentations, implant training

**UNIT I Introduction To Disasters** - Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Natural disasters – Earthquake, Landslide, Flood, Drought, Cyclone etc – Manmade Disasters - Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures(Building and Bridge), War & Terrorism etc. Classification Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc. Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change - Dos and Don'ts during various types of Disasters.

**Unit II Risk and Vulnerability Analysis** - Risk: Its concept and analysis - Risk Reduction - Vulnerability: Its concept and analysis - Strategic Development for Vulnerability Reduction - Disaster Preparedness and Response Preparedness Disaster Preparedness: Concept and Nature. Disaster Preparedness Plan - Prediction, Early Warnings and Safety Measures of Disaster. Role of Information, Education, Communication, and Training. Role of Government, International and NGO Bodies. Role of IT in Disaster Preparedness. Role of Engineers on Disaster Management.

**UNIT III:** Inter-Relationship Between Disasters and Developments - Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India – Relevance of indigenous knowledge, appropriate technology and local resources.

**Unit IV** Rehabilitation, Reconstruction and Recovery - Reconstruction and Rehabilitation as a Means of Development. Damage Assessment. Post Disaster effects and Remedial Measures. Creation of Long-term Job Opportunities and Livelihood Options. Disaster Resistant House Construction. Sanitation and Hygiene. Education and Awareness - Dealing with Victims' Psychology - Long-term Counter Disaster Planning - Role of Educational Institute.

**UNIT V** Geographical Information System and ICT in Disaster Management - Definition of GIS, Concept of Space and Time, Spatial data. Map Projection and Datum - Domains of Spatial information system, Components of GIS (Hardware, Software, Data, People and Process) GIS Functionalities for end user / system (Data Acquisition, Data Input, Data Management, Data Analysis, Data Modeling and Data Output)

**UNIT VI** Role of Information Technology in Disasters - Disaster management Information System - Organizing and effective dissemination of information: feedback for improving information - Role of Communication in Disasters, Types of communication in case of disasters – HAM radio, Satellite, Video Conferencing, Electronics devices

#### **Reference:**

1. Andrew, S., "Environmental Modeling with GIS and Remote Sensing", John Willey, 2002
2. Ariyabandu, M. and Sahni P. "Disaster Risk Reduction in South Asia", Prentice-Hall (India), 2003.
3. Bell, F.G., "Geological Hazards: Their assessment, avoidance and mitigation", E & FN SPON Routledge, London. 1999
4. Bossler, J.D., "Manual of Geospatial Science and Technology", Taylor and Francis, 2001
5. C. K. Rajan, Navale Pandharinath, Earth and Atmospheric Disaster Management: Nature and Manmade B S Publication.
6. David Alexander, "Natural Disasters", Research Press, New Delhi, 1993
7. Dr. Mrinalini Pandey, Disaster Management Wiley India Pvt. Ltd.
8. J. P. Singhal, Disaster Management Laxmi Publications.
9. Jagbir Singh, Disaster Management: Future Challenges and Opportunities K W Publishers Pvt. Ltd.
10. Matthews, J.A., "Natural hazards and Environmental Change", Bill McGuire, Ian Mason, 2002
11. Mitigating Natural Disasters, Phenomena, Effects and options, A Manual for policy makers and planners, United Nations. New York, 1991
12. Nick Carter. W., "Disaster Management - A Disaster Manager's Handbook". Asian Development Bank, Philippines. 1991
13. Shailesh Shukla, Shamna Hussain Biodiversity, Environment and Disaster Management Unique Publications
14. Tushar Bhattacharya, Disaster Science and Management McGraw Hill Education (India) Pvt. Ltd.