

Guru Nanak Dev Engineering College, Ludhiana
An Autonomous College under UGC Act 1956
B.Tech. Civil Engineering

Course Code: MC103/BCEXXX/BCAXXX (BCE130)
Course Title: Disaster Management and Preparedness

Programme: B.Tech.	L: 2 T: 0 P: 0	Credits: 0
Semester: 5 th /6 th	Theory/Practical: Theory	Teaching Hours: 30(L)+0(T)+0(P) = 30hrs
Total Max. Marks: 50	Continuous Assessment (CA) Marks: 50	End Semester Examination (ESE) Marks: Nil
Minimum Percentage of Numerical / Design / Programming Problems in ESE: Nil		
Duration of End Semester Examination (ESE): Nil		
Course Type: Mandatory Course (Non-Credit)		

Prerequisites (if any): NIL

Additional Material Allowed in ESE: NIL

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
1	Explain the fundamental concepts of disaster management, including hazards, vulnerabilities, risks, capacities, impacts, prevention, and mitigation strategies.
2	Classify the various natural and human-induced disasters for preparing the hazard and vulnerability profile of India.
3	Assess the environmental, social, economic, health, and demographic impacts of disasters to perform basic vulnerability and risk assessment for disaster-prone areas.
4	Apply the principles of the disaster management cycle for effective disaster risk reduction.
5	Describe the role of modern technologies in disaster prediction, monitoring, and management.
6	Demonstrate awareness of disaster management practices for various stakeholders in building resilient and sustainable communities.

Contents

Part-A

Unit I: Introduction to Disaster Management (2 Hours)

Concepts and definitions of disaster, hazard, vulnerability, emergency and risk; severity, frequency and exposure of hazards; capacity, resilience and impacts of disasters; principles of prevention, preparedness and mitigation for reducing disaster risks

Unit-II: Classification of Disasters (6 Hours)

Classification of disasters: natural disasters including floods, droughts, cyclones, earthquakes, tsunamis, landslides, volcanic eruptions, coastal erosion, soil erosion and forest fires; human-induced disasters such as industrial accidents, chemical spills, nuclear and radiological emergencies, transportation accidents, urban flooding and terrorist activities; hazard and vulnerability profile of India with special emphasis on mountain regions, coastal areas and ecologically fragile zones

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Unit-III: Disaster Impacts and Risk Assessment

(8 Hours)

Environmental, physical, social, ecological, economic and political impacts of disasters; health and psychosocial consequences; demographic considerations including gender, age and special-needs groups; global and national disaster trends; climate change and urban disasters; concepts of vulnerability analysis, risk assessment and risk mapping; stages of disaster recovery and associated challenges.

Part-B

Unit-IV: Disaster Risk Reduction and Management

(7 Hours)

Disaster management cycle and its phases including prevention, mitigation, preparedness, response, relief, recovery and rehabilitation; structural and non-structural mitigation measures; risk analysis, vulnerability and capacity assessment; early warning systems; post-disaster environmental response including water supply, sanitation, food safety, waste management, disease control, communication and security; emergency medical and public health services; reconstruction and rehabilitation; capacity building and gender-sensitive approaches; roles and responsibilities of government agencies, local institutions, communities, NGOs, media and insurance sector; disaster management policies, legislation and program in India with reference to the National Disaster Management Authority.

Unit-V: Application of Science and Technology in Disaster Management

(4 Hours)

Role of Geographic Information System (GIS), Remote Sensing, Global Positioning System (GPS), Internet of Things (IoT), Artificial Intelligence (AI), drones and mobile applications in disaster prediction, monitoring and management; disaster communication systems and dissemination of early warning information; knowledge-based expert systems and risk-time charts; influence of developmental projects, land-use changes and urbanization on vulnerability; Sustainable Development Goals (SDGs), disaster resilience, reconstruction and resilient development strategies.

Unit-VI: Accessibility and Inclusive Disaster Management

(3 Hours)

Accessibility in disaster preparedness, mitigation, response and reconstruction; inclusive emergency planning and evacuation measures; emergency services and communication systems for persons with disabilities and vulnerable populations; universal accessibility and resilient community development for achieving inclusive and sustainable disaster management.

Text Books/ Reference:

1. S.C. Sharma, Disaster Management, Khanna Publishing House, 2022.
2. <http://ndma.gov.in> (Home page of National Disaster Management Authority)
3. <http://www.ndminfo.nic.in> (National Disaster Management in India, Ministry of Home Affairs).
4. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
5. Singh B.K., 2008, Handbook of Disaster Management: Techniques & Guidelines, Rajat Publication.
6. Singh Jagbir, Disaster Management – Future Challenges & Opportunities, I.K. International Publishing House.
7. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation.
8. Disaster Medical Systems Guidelines, Emergency Medical Services Authority, State of California, EMSA no.214, June 2003
9. Inter-Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings, Geneva: IASC.