

Natural Hazards and Risk Reduction

1.1. Course Number: GE512

1.2. Contact Hours: 3-0-0 Credits: 9

1.3. Semester Offered: 5th Year-Odd

1.4. Prerequisite: Engineering geology

1.5. Syllabus Committee Members: Dr. Alok Kumar Singh & Dr. Hemant Kumar Singh

2. **Objective:** The course is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control as well as the disasters and environmental hazards induced by human activities with emphasis on disaster preparedness, response, and recovery.

3. **Course Content:** Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topics	Lectures
1	Natural Hazards & Disaster	Natural hazards and disasters, Human Impact on Natural Disaster: Changing Perspectives of Natural Hazards, Categorization of Natural Hazards (i.e., Earthquakes, Tsunami, volcanic eruptions, drought, floods and flash floods, mass movements, landslides, thunderstorm, Tornado and Wildfires), Causes, effects, and practical examples for all disasters.	17
2	Disaster Preparedness and Response	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; Disaster Response: Introduction, Disaster Response Plan Communication, Participation, and Activation of Emergency Preparedness Plan, Search, Rescue, Evacuation and Logistic Management, Role of Government, International and NGO Bodies, Psychological Response and Management (Trauma, Stress, Rumor and Panic), Relief and Recovery, Medical Health Response to Different Disasters	14
3	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	9

		Awareness, Dealing with Victims' Psychology, Long-term Counter Disaster Planning, Role of Educational Institute.	
			Total
			40

4. Readings:

4.1. Textbook:

- Mrinalini Pandey (2014) Disaster Management, Wiley India Pvt. Ltd.
- Bryant E.A. (2012) Natural Hazards, Cambridge University Press
- Indrajit Pal and Tuhin Ghosh (2019), Natural Hazards Management in Asia, SAGE Publications Pvt. Ltd.

4.2. Reference books:

- Bell, F. G. (1999): Geological Hazards, Routledge, London.
- Bieniawski, Z. T. (1989): Engineering Rock Mass Classification, John Wiley.

5. Outcome of the course:

After the completion of this paper, the student should be able to:

- Describe the influence of mitigation, preparation, response and recovery on natural hazards.
- Compare and critically analyze recent disasters caused by natural events.
- Analyze, generate, and transmit a coherent explanation of the social and economic impacts and implications of natural hazards at regional, national and international scales.
- Critically evaluate and analyze the factors that influence whether communities are resilient to natural hazards, and communicate this critical analysis to others.