PHY : Disaster Management

Programme: B.Tech. (CSE/ECE/CCE/ME) Year: 4th Semester: odd Semester
Course : OTHER ELECTIVE Credits : 3 Hours : 40 hours

Course Context and Overview:

Natural or even man-made calamities that cause human, environmental and economic losses are called disasters. In this course, the meaning of disasters, factors responsible for them, their impact on human life and development, the objectives and challenges of disaster management and the idea of Disaster Risk Reduction will be discussed. India, with its geographical diversities, is a disaster prone nation. It's not just loss of life and property, but it also has vast and long term socio-economic impacts. According to reports, the last decade was the worst on record for economic losses from natural disasters. The recent trend of increasing number of natural calamities makes the subject more relevant for disseminating knowledge to raise awareness about disaster management and mitigation of the problems of natural and man-made disasters.

Prerequisites Courses:

NIL

Course outcomes (COs):

On completion of this course, the students will :
CO1: understand the concepts, terminologies of disaster and will learn about the characteristics of major disasters (both natural and man-made)
CO2: understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
CO3: gain a preliminary understanding of approaches of Disaster Risk Reduction
CO4: learn the role of science and technologies within all phases of the disaster management cycle

Course Topics:

UNITS	COURSE TOPICS	Lecture Hours
UNIT - I	**Understanding Disasters:** Understanding the concepts and definitions of disaster, hazard, vulnerability, resilience, risk.	4
UNIT - II	**Types, Trends, Causes and Consequences of all disasters:** Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); Biological Disasters (epidemics/pandemic in humans, plants, animals, pest invasions, forest fire); Recent disasters caused by extreme natural events around the world; Pandemic – risk, impact. Global disaster trends – global warming, climate Change, ozone depletion, disposal of hazardous toxic wastes; Biological Disasters – case studies (COVID 19, Spanish flu etc).	13
UNIT – III	**Industrial Disasters:** Type of industrial disasters: chemical, mining, nuclear etc. Causative factors leading to industrial disasters; Impact of industrial disasters on human lives and the environment; Major chemical disasters in India - Bhopal Gas Disaster in 1984, massive fire in a gas well in Andhra Pradesh (2003) and in Assam (2020) etc.; Prevention, preparedness, and mitigation for chemical disasters.	5
UNIT - IV	**Inter-relationship between Disasters and Development:** Impact of Development projects such as dams, embankments, changes in Land-use etc.; Climate Change Adaptation; Relevance of indigenous knowledge, appropriate technology and local resources.	5
UNIT – V	**Disaster Risk Reduction :** Disaster cycle; Hazard and vulnerability profile of India; Institutional arrangement; Prevention and mitigation; Disaster preparedness - prediction and safety measures; Disaster Risk Reduction (DRR); Components of disaster relief like water, waste management etc; Water harvesting measures to combat drought; Disaster response plan.	7
UNIT - VI	**Disaster Management in India :** Disaster Profile of India – mega disasters of India (natural & man-made) and lessons learnt; National guidelines and plans on disaster management; Role of educational Institute - education and awareness; Role of Government and Non-Government agencies. Role of science and technology in disaster management: Geo-informatics in Disaster Management (GPS, GIS etc); Disaster Communication System (early warning and its dissemination)	6

Textbook references :

[1] D. P. Coppola *Introduction to International Disaster Management*, Elsevier Science (B/H), London 2007.
[2] M. C. Gupta, *Manual on natural disaster management in India* NIDM, New Delhi
[3] R. K. Bhandani, *An overview on natural & man-made disasters and their reduction*, CSIR, New Delhi
[4] Anu Kapur and others, *Disasters in India Studies of grim reality*, Rawat Publishers, Jaipur, 2005, pp. 283
[5] H. N. Srivastava and G. D. Gupta, *Management of Natural Disasters in developing countries*, Daya Publishers, Delhi, 2006, pp. 201
[6] D. Alexander, *Natural Disasters,* Kluwer Academic London, 1999, pp. 632.

Additional Resources : (NPTEL, Web resources etc.)

Evaluation Methods:

Evaluation criteria will be shared by the concerned course instructor.