

**DEPARTMENT OF ENVIRONMENTAL
STUDIES**

ADD ON Course

Course Code	
Title of the course	Ecosystem - Disaster Risk Reduction and Climate Change Adaptation
Semester in which the course is to be taught	1
No. of credits	2
No. of contact hours	36

Course Objectives:

- Understanding of different types of disasters and its causes and impacts on the society, region and environment.
- Learning and analyzing the vulnerability, its implications and the practical processes involved in, the management of disasters at various levels.
- Assessing the challenges and limitations involved in the response and recovery during and post disasters.
- Equip students with knowledge of various Ecosystems - Disaster Risk Reduction and Climate Change Adaptation and make students aware and understand the importance.
- It will generate more interdisciplinary interest and knowledge products in due course.

Course Outcome (CO):

1. Learning disaster management, its components (eg: definitions, terminologies, types, impacts), structure (phases, administrative and institutional) and significance.
2. Incorporating disaster management into public policy and planning based on the vulnerability of places and communities.
3. Describe the concepts of Disaster Risk Reduction, Climate Change adaptation and Resilience and their implication for programming.
4. Explain the main steps needed to carry out Disaster Risk Assessment and their outputs to inform programming.
5. Identify tools and frameworks to mainstream disaster risk reduction, climate change adaptation and strengthen resilience in their operating context.
6. Learn to develop emergency operations plan (EOP- eg: Components, structure, Activities, SAR); Understanding the significance of the Community-Based Approach to education and public awareness in tackling disasters. Studying disaster response and recovery methods (eg: traditional/modern; short term/long term, environmental friendly/sustainable initiatives) etc.
7. Brief knowledge in understanding the interrelations between humans and their natural environment and understand the linkages between global environmental problems and disasters.
8. Understand the importance of the Sustainable Development Goals (SDG) for disaster risk reduction.
9. Explore means by which they can coordinate with implementing partners and other agencies to improve DRR.

COURSE DESIGN

Module I	3 Hours
Module II	6 Hours
Module III	7 Hours
Module IV	5 Hours
Module V	3 Hours
Module VI	12 Hours

MODULE 1: INTRODUCTION TO DISASTER: (*Disaster risk reduction (DRR), Climate Change Adaptation (CCA) and frameworks*) (3 Hours)

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, DRR, CCA, resilience and Capacity – Disaster and Development, and disaster management. Analyse the Relationship between Development and Disasters. Types (*Geological, Hydro-meteorological, Biological, Technological and Man - made Disaster*), Global Disaster Trends

- Emerging Risks of Disaster - Climate Change and Urban Disasters. Implications of disasters on environment, Environmental Planning and management for environmental hazards.

MODULE II: ELEMENTS OF DISASTER MANAGEMENT (6 Hours)

Introduction, Disaster Management Cycle, Disaster Mitigation, Mitigation strategies, Hazard identification and vulnerability analysis, Mitigation measures, Disaster Preparedness and prevention, Disaster Risk Reduction (DRR), the Emergency Operation Plan (EOP) Disaster Response and Recovery, Modern methods of disaster response, The Recovery Plan. Disaster Management Act (2005), Disaster Management Policy (2009), organizational framework for disaster management in India.

MODULE III: ECOSYSTEM-BASED DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION (CCA) (7 Hours)

Fundamental concepts of ecosystems and ecosystem services and principles for DRR and CAA. Implication of disasters and its impact on environment, environmental planning and management. Ecosystem based adaptation. Global environmental problems and disasters. Ecosystem services for vulnerability reduction. Ecological Engineering for DRR and CAA. Ecosystem values for DRR and assessing cost and benefits of DRR measures.

MODULE IV: INSTRUMENTS AND APPROACHES (5 Hours)

Introduction to various ecosystem based tools and approaches for reducing DRR and CCA {(RS, GIS, GPS and RS) Disaster Communication System (Early Warning and Its Dissemination)}. Integrated Water Resources Management/River basin Management/Coastal Zone Management. Managing ecosystems for urban risk reduction. Community-based Ecosystem and Disaster Risk Management. Integrating DRR into culture. Strategic Environmental Assessments for DRR and CSS. Policy instruments for Eco-ecosystem management, DRR and CCA. Stakeholder analysis: Organizational/institutional assessments at different scales: international, national, local.

MODULE V: ECONOMICS OF DISASTER RISK REDUCTION (3 HOURS)

Macroeconomic effects of natural and manmade disasters. Economics for disaster recovery and reconstruction. Economic costs of disasters losses – who pays for disasters? Investing in natural disaster risk reduction.

MODULE VI: CASE STUDY / FIELD WORK (12 HOURS)

Case studies on Eco-DRR or CSS in different counties with different disaster situation. Design an ecosystem-based project for increasing resilience and reducing DRR and CSS:

Hazard mapping of vulnerable areas, Vulnerability assessment (physical, social, organizational, economical and technological), Risk mitigation planning for vulnerable areas.

REFERENCE

Text books

1. Alexander, D. Natural Disasters, ULC press Ltd, London, 1993.
2. Carter, W. N. Disaster Management: A Disaster Management Handbook, Asian Development Bank, Bangkok, 1991

Papers

1. Disaster Management in India, Ministry of Home Affairs, Government of India, New Delhi, 2011.
2. National Policy on Disaster Management, NDMA, New Delhi, 2009.
3. Disaster Management Act. (2005), Ministry of Home Affairs, Government of India, New Delhi, 2005.
4. District Disaster Management Plan-Model Template, NIDM, New Delhi, 2005. A Global Report - Reducing Disaster Risk, A Challenge for Development; UNDP Publication, 2004.
5. Good practices in community based disaster risk management; GoI- UNDP Disaster Risk Management Programme; 2002 – 09.
6. Alexander, D. Introduction in Confronting Catastrophe, Oxford University Press, 2000
7. Chakrabarty, U. K. Industrial Disaster Management and Emergency Response, Asian Books Pvt. Ltd., New Delhi 2007.
8. Geomorphological Techniques by Andrew Goudie, Published by Academic Division of Unwin Hyman Ltd. London, UK, 1990.
9. Parasuraman, S & Unnikrishnan, P. V. (ed.), India Disasters Report Towards a policy initiative. Oxford, 2000.
10. Valdiya, K. S., Environmental geology Indian context. Tata McGraw Hills, 1987.
11. Encyclopedia of disaster management, Vol I, II and III. Disaster management policy and administration, S L Goyal, Deep & Deep, New Delhi, 2006
12. Encyclopedia of Disasters – Environmental Catastrophes and Human Tragedies, Vol. 1 & 2, Angus M. Gunn, Greenwood Press, 2008
13. Disasters in India Studies of grim reality, AnuKapur & others, 2005, 283 pages, Rawat Publishers, Jaipur
14. Management of Natural Disasters in developing countries, H.N. Srivastava & G.D. Gupta, Daya Publishers, Delhi, 2006,

201 pages

15. Natural Disasters, David Alexander, Kluwer Academic London, 1999, 632 pages

16. Disaster Management Act 2005, Publisher by Govt. of India