

# Vidyasagar University

## *Curriculum for B.Sc. (General) in Disaster Management* [Choice Based Credit System]

### Semester-I

| Course                        | Course Code | Name of the Subjects                            | Course Type/<br>Nature | Teaching Scheme in hour per week |   |   | Credit    | Marks      |
|-------------------------------|-------------|---|------------------------|----------------------------------|---|---|-----------|------------|
|                               |             |   |                        | L                                | T | P |           |            |
| <b>CC1</b><br><b>[DSC-1A]</b> |             | <b>C1T:</b> Introduction to Disaster Management | Core Course-1          | 5                                | 1 | 0 | 6         | 75         |
| <b>CC2</b><br><b>[DSC-2A]</b> | TBD         | <b>DSC-2A (other Discipline)</b>                | Core Course-2          |                                  |   |   | 6         | 75         |
| <b>CC3</b><br><b>[DSC-3A]</b> | TBD         | <b>DSC-3A (other Discipline)</b>                | Core Course-3          |                                  |   |   | 6         | 75         |
| <b>AECC</b>                   |             | English   | AECC (Elective)        | 1                                | 1 | 0 | 2         | 50         |
|                               |             |   |                        |                                  |   |   |           |            |
| <b>Semester Total</b>         |             |   |                        |                                  |   |   | <b>20</b> | <b>275</b> |

**L**=Lecture, **T**=Tutorial, **P**=Practical, **CC** = Core Course, **TBD** = To be decided, **AECC**= Ability Enhancement Compulsory Course

**DSC-1** = Discipline Specific Core of Subject-1, **DSC-2** = Discipline Specific Core of Subject-2, **DSC-3** = Discipline Specific Core of Subject-3.

## Semester-I Core Course (CC)

### CC-1: Introduction to Disaster Management

Credits 06

C1T: Introduction to Disaster Management

**Unit-I Introduction to Disaster: Disaster:** Concepts and definitions (Disaster, Hazards, Vulnerability, Resilience, Risks). Factors & significance, causes, nature, types and magnitude of disasters. History of Disaster. Parameters of Disaster Risks. Levels of disasters as per national guideline.

Disaster trends (Global, national, regional). Slow onset and rapid onset disasters, also predictable and unpredictable disasters. Difference between accidents and Disasters. Simple and Complex disasters, Brief explanation of some frequently occurring natural disasters in India.

Impacts of disasters (including social, economic, political, environmental, health, psychosocial, etc.). Differential impacts – in terms of caste, class, gender, age, location, disability, Global trends in disasters : urban disasters, pandemics, complex emergencies, Climate change. Classification of hazards. Response time, frequencies, forewarning, exposure time of different hazards. General characteristics and problem areas of different natural and manmade hazards. Common approaches to study natural and manmade hazards; vulnerability and disasters.

Equity issues in disasters. Aims of disaster management. Principles and component of disaster management. Dimension of natural and anthropogenic disaster.

**Unit-II : Consequences of disaster:** causes and consequences of hazards-physical, economic, cultural. Repercussion of disasters and hazards, Economic damage. Loss of human and animal life. Destruction of Ecosystem.

### Unit-III : Global perspectives:

- **Natural disaster** - Study of environmental impacts induced by human activity. Causes, impact, consequences, trends understanding of: Earthquake, volcanisms, cyclones, tsunamis, floods, draughts and famines, landslides and avalanches, heat and cold waves.
- **Man-made disasters:** Biological disasters, chemical disasters, nuclear disasters, building fire, cold fire, forest fire, oil fire, air pollution, water pollution, deforestations, industrial pollution, road accidents, rail accidents, air accidents, sea accidents, oil slicks and spills, out- break of disease and epidemic, building collapse, rural and urban fire, war and conflicts, over exploitation of natural resources.

**Unit – IV: Inter-relationship between Disasters and Development:** factors affecting vulnerabilities, differential impacts, 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. Different stakeholders in disaster relief. Refugee operation during disasters. Pre-disaster and post disaster human resettlement and rehabilitations issues during and after disasters. Inter sectorial coordination during disasters. Model of Disasters.

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**Semester-II**

| Course                | Course Code | Name of the Subjects   | Course Type/<br>Nature | Teaching Scheme<br>in hour per week |   |   | Credit    | Marks      |
|-----------------------|-------------|--|------------------------|-------------------------------------|---|---|-----------|------------|
|                       |             |  |                        | L                                   | T | P |           |            |
| <b>DSC-1B</b>         |             | DSC1BT: Disaster Management Planning, Risk assessment and vulnerability analysis<br>DSC1BP: <b>Practical</b> | Core Course            | 4                                   | 0 | 4 | 6         | 75         |
| <b>DSC-2B</b>         | TBD         | <b>DSC-2A (other Discipline)</b>   | Core Course            |                                     |   |   | 6         | 75         |
| <b>DSC-3B</b>         | TBD         | <b>DSC-3A (other Discipline)</b>   | Core Course            |                                     |   |   | 6         | 75         |
| <b>AECC</b>           |             | ENVS   | AECC<br>(Elective)     |                                     |   |   | 4         | 100        |
| <b>Semester Total</b> |             |  |                        |                                     |   |   | <b>22</b> | <b>325</b> |

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**DSC-3** = Discipline Specific Core of Subject-3.

**Semester-II**  
**Core Course (CC)**

**DSC-1B (CC-2): Disaster Management Planning, Risk assessment and vulnerability analysis** **Credits 06**

**DSC1BT: Disaster Management Planning, Risk assessment and vulnerability analysis**

**Credits 04**

**Course Contents:**

**A. Disaster management and planning**

**Management and disaster**

Nature, scope and management process. Policy of disaster management, Types of planning. Identifying crisis situation. Role, skills and competencies. Control process in disaster management. Team building in disaster management. Components of disaster relief: water, food, sanitation, shelter, health, waste management.

**Disaster management concepts, elements and disaster management cycle:**

Disaster management cycle – paradigm shift in disaster management. Different phase of Disaster Management Cycle (DM Cycle). Relief mechanism (needs assessments, relief administration and distribution, management of relief centers, external supports, etc.). Compensation and insurance.

Pre disaster management, post disaster management, integrated development planning for disaster management, long term disaster counter planning.

Pre - disaster management – risk assessment and analysis, risk mapping, zonation and microzonation. Prevention and mitigation of disasters. Planning & Designing structural and non structural measures, Early warning system: preparedness, capacity development, awareness.

During disaster – Evacuation, disaster communication, search and rescue, Emergency operation centre, Incident command system, Relief and rehabilitation.

Post disaster management - search, rescue, evacuation and other logistic management. Relief. Damage and needs assessments, restoration of critical infrastructure. Early recovery, reconstruction and re-development.

National and International policies for disaster managements. IDNDR, Yokohama strategy, Hyogo framework, of action.

**Disaster management planning:** Planning strategies ( State and District DM planning); planning needs. Management of essential supplies and temporary shelter. Site management. Medical trauma and stress management. Early warning and prediction system: Role of IT, RS, GIS, GPS and ICS. District wise contingency planning, participatory disaster management.

### **Emerging approaches to Disaster Management:**

(a) Pre - disasters stage preparedness – hazards zonation maps – predictability and forecasting warning, land use zoning, information, Education & Communication (IEC) Disaster resistance house construction, planning and construction of flood shelters, and cyclone shelters, population reduction in vulnerable area and awareness. (b) Emergency stage – Rescue training for search and operation at national and regional level, ground management plan preparation, immediate relief, assessments surveys. (c) Post disaster stage rehabilitations- political administrative aspects, social aspects, economic aspects, cultural aspects and environmental aspects.

### **Disaster management in India**

Disaster profile in India – Hazard and vulnerability profile of India. Disaster management-India's scenario. Mega disaster in India and lesson learnt. Regional perspectives of hazards in India with reference to dimension, causes, consequences and remedial measures: (a) Hills/Coasts, (b) Terrorisms. Disaster prone areas in India: Study of seismic zone, area of prone to floods and draughts, landslides and avalanches, Area prone to cyclonic and coastal hazards with special references to Tsunami: post disaster disease and epidemics.

Institutional arrangements (Mitigation, Response and Preparedness, DM acts and policies, other related policies, plans, program and legislations). Disaster management acts 2005- Institutional and Financial mechanism. Disaster management policy (2009).

Organizational framework for disaster management in india. Role of national and international organization for Disaster management. National guidelines and plans for disaster management. Role of Government (Local, State and International), non Government and inter Governmental agencies. National Institute of Disaster Management, National Disaster Response Force (NDRF), National Disaster Management Authority, State Disaster Management Authority, District Management Authority.

Disaster preparedness and management: Preparedness: monitoring of phenomena triggering a disaster or hazards. Evaluation of risk. Application of remote sensing, data from metrological and other agencies.

Disaster case studies in India: Bhopal Gas Disasters, Earthquake in Gujrat, Super Cyclone in Orissa, South India Tsunami, Plague in Surat, Landslides in North East, Bengal famine.

Development projects in India (dams, SEZ) and their impacts, Logistic management in specific emergency situation. Brief idea on: Rajib Gandhi Rehabilitation Package, Integrated Coastal

Zone Management, National Flood Risk Mitigation Projects (NFRMP), mines Safety in India, Indian Meteorological Departments, national Crisis Management Committee, Indian National Centre for Oceanic Information System (INCOIS).

## **B. Risk assessment and vulnerability analysis**

Disaster Risks: Understanding risk - Concepts and elements. Global and national risk situation. Disaster risk reduction. Community based disaster risk reduction. Structural – non structural measures, Role and responsibility of the community, Panchayati Raj Institution/Urban local bodies (PRIs/ULBs), States, Centers and other stakeholders. Strengthening capacity for reducing risks.

Disaster risk assessment (Hazard- vulnerability-capacity analysis): Participatory risk assessments. Vulnerability analysis and risk assessment. Technique of risk assessments. Global cooperation in risk assessments and warning. People's participation in Risk assessments. Strategies for survival.

Vulnerability analysis: Vulnerability concepts and parameters. Risks and vulnerability relationships. Observation and perception of vulnerability. Vulnerability identification. Socio economic factors in vulnerability. Vulnerability analysis. Socio economic vulnerability, Human Development Index (HDI) development.

Techniques of risks and vulnerability analysis: Risks assessments and vulnerability analysis techniques. Remote sensing and GIS basic concepts and elements.

Vulnerability and Development: The role of development. Resource analysis and mobilization. Strategic development for vulnerability reduction.

## **DSC1BP: Practical**

**Credits 02**

### **1. First aid practices for Hazards:**

- a. Principles of First Aids. First aids for Snake bite, Burns and Scalds, Drowning, Poisoning, Dog bite. Bleeding control.
- b. Identification of bones of skull hands and feet. First aids for bone fracture.

### **2. Measuring Devices:**

Basic concepts on – Lux Meter, Turbidity Meter, under water photometer, Current meter, Hygrometer, Bacteriological water sampler, vertical gravity corer, Microscope.

### **3. Analysis of water: Physical, Chemical & Biological.**

### **4. Mapping: Basic ideas of mapping. Techniques of mapping. Mapping of living resources. Mapping of Hazard prone areas.**

### **5. Field reports: Students will be asked to submit a field reports on visit any establishment of importance for disaster management organized by the Institution.**

### **6. Laboratory Note Book and Viva-voce**

