



DIPLOMA IN DISASTER MANAGEMENT

Course Name: Diploma in Disaster Management

Duration: 1 Year

Eligibility: 10+2 or Equivalent

DETAILED SYLLABUS

Semester I	Semester II
Introduction to Disaster Management	Disaster Preparedness
ICT for Disaster Management	Disaster Response
GIS in Disaster Management	Rehabilitation Reconstruction and Recovery
Industrial Disaster Management	Industrial Safety Management
Risk Assessment and Vulnerability Analysis	Finance and Insurance in Disaster Management

SEMESTER I

PAPER 1: INTRODUCTION TO DISASTER MANAGEMENT

CONTENT:

Unit 1: Hazard, Risk, Vulnerability, Disaster; Disaster Management, Meaning, Nature Importance, Dimensions & Scope of Disaster Management, Disaster Management Cycle. National disaster management framework; financial arrangements for Disaster management, International Strategy for Disaster reduction.

Unit 2: Natural Disasters Natural Disasters- Meaning and nature of natural disasters, their types and effects Hydrological Disasters - Flood, Flash flood, Drought, cloud burst Geological Disasters- Earthquakes, Landslides, Avalanches, Volcanic eruptions, Mudflow Wind related- Cyclone, Storm, Storm surge, tidal waves *Heat* and cold Waves, Climatic Change, Global warming, Sea Level rise, Ozone Depletion

Unit 3: Manmade Disaster CBRN – Chemical disasters, biological disasters, radiological disasters, nuclear disasters Fire – building fire, coal fire, forest fire, Oil fire *Accidents*- road accidents, rail accidents, air accidents, sea accidents Pollution and deforestation- air pollution, water pollution, deforestation, Industrial wastewater pollution, deforestation

Unit 4: Disaster Determinants Factors affecting damage – types, scale population, social status, habitation pattern, physiology and climate. Factors affecting mitigation measures, prediction, preparation, communication, area and accessibility, population, physiology and climate

Suggested Readings

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Disaster Management- G.K Ghosh-A.P.H. Publishing Corporation
3. Disaster management – S.K. Singh, S.C. Kundu, Shobha Singh A – 119, William
4. Publications, New Delhi.
5. Disaster Management – Vinod K Sharma- IIPA, New Delhi,1995
6. Encyclopaedia of Disaster Management- Goel S.L. - Deep and Deep Publications, New Delhi, 2006.

PAPER 2: ICT FOR DISASTER MANAGEMENT

CONTENT:

Unit 1: Computer Systems- Computer, Basic Organization of Computers, Classification of Computers, Hardware, Software, Computer Languages, Computer Memory, Types of Memory (Primary and Secondary), Secondary Storage Devices, I/O Devices, Application software, Software Package, Operating Systems, Database Management System, Data Warehousing and Data Mining

Unit 2: Information Communication Technology- Business Data Processing- Data storage hierarchy, methods of organizing data, file management Data Communications and Computer Networks- Elements of Communication Systems, Data transmission modes, speed, media; Digital and Analog data transmission, Switching techniques, Routing Techniques, Network topologies, Network Types, Communication protocols, wireless networks, Internet, multimedia

Unit 3: Information Processing- Definition, difference between Data and Information, Relevance of Information to Decision Making, Source and Types of Information, Quality of Information, Value of information, Data Collection methods, Assessing Information Needs, Management Information Systems, Decision Making Concept-Models of Decision Making

Unit 4: Advanced Information Communication Technology-Tsunami Early Warning System, Forest Resource Information System, GIS, Remote Sensing, Digital Image Processing, emergency communication System, Bluetooth and Wireless communication, HAM Radio.

Unit 5: Disaster Management Information Sources Forecasting & warning: Indian meteorological department, tsunami warning centre, pacific disaster centre, central water commission; Resources: UNISDR, USAID, Red Cross, Indian disaster resource network; National disaster management authority, National Institute of disaster management, National Geophysical Research Institute, Bhuwan, National disaster response force, State and district disaster management centre

Suggested Readings

1. Computer Fundamentals- P. K. Sinha, BPB Publications
2. Fundamentals of Computers - V. Rajaraman - PHI Publication, IVth Edition.
3. Fundamentals of Programming - Raj K. Jain - S. Chand Publication
4. Database System Concepts - Abraham Silberschatz and Henry Korth, Sudarshan: Tata McGraw-Hill- IVth Edition, ISBN: 0-07-120413-X
5. Fundamentals of DataBase Systems- Elmasri and Navathe, Addison-Wesley, 1999, IIIrd Edition
6. Fundamentals of Remote Sensing - Noam Levin, November 1999
7. Introduction to Remote Sensing - Dr Robert Sanderson - New Mexico State University

PAPER 3: GEOGRAPHICAL INFORMATION SYSTEM IN DISASTER MANAGEMENT

CONTENT:

Unit 1: Introduction- Geographical Information Systems - definition, development, data sources, data structures, raster and vector, data capturing, pre-processing, Introduction to Geomorphology and Geology, Study the stratigraphy of India, Morphometric analysis with the help of remote sensing & GIS techniques.

Unit 2: Data base management systems in GSI- Concept and scope, data manipulations and product generation- Environmental GIS, Data acquisition system using GPS On line GPS applications.

Unit 3: Geographical Information System- Spatial data; sources of error and data quality; database design, convention, mapping concepts and Coordinate systems. Methods of spatial interpolations in Geographical Information Systems; visualizations in Geographical Information Systems, linking terrain, climate and socio economical parameters to target the vulnerability due to natural disasters using GIS and Remote Sensing.

Unit 4: GIS SOFTWARE- Over view of GIS software - Arc Info; Arc View Principles, operation protocols and hands on training query based information retrieval Web GIS Online GIS and its data applications. Development of GIS based decision support for disaster risk reduction.

Suggested Readings

1. Remote Sensing Principles & Applications - B.C. Panda - Viva Book Pvt.Ltd.
2. Remote Sensing and Geographical Information systems - M. Anji Reddy JNTU Hyderabad 2001, B.S. Publications.
3. Remote Sensing and its applications - LRA Narayana - University Press 1999.
4. Principals of Geo Physical Information Systems - Peter A Burragh and Rachael, A. Mc Donnell- Oxford Publishers 2004.
5. Concepts & Techniques of GIS - C.P. Lo Albert, K.W. Yonng - Prentice Hall (India) Publications.
6. GIS - Kang tsung chang, TMH Publications & Co.,
7. Basics of Remote sensing & GIS - S. Kumar- Laxmi Publications.

PAPER 4: INDUSTRIAL DISASTER MANAGEMENT

CONTENT:

Unit 1: Introduction- Concept, Need and Importance of Industrial Disaster Management

Unit 2: Industrial Hazards- Chemical hazards, Biological hazards, Radiological hazards, nuclear hazards, Physical hazards, Electrical hazards, Fire hazard, Gas hazards etc.

Unit 3: Risk Assessment & Hazard Identification- Checklist procedure, Preliminary hazard analysis, What if analysis, Failure mode effect analysis, Hazard and operability (HAZOP) studies, Hazard analysis techniques: Fault tree analysis, Event tree analysis, General outline of DOW index, Risk estimation and management, Major hazard control, Identification of hazard, Categorization methods for elimination of hazard, Mechanical hazards; Machine guarding, safety with hand tools/ portable power tools, Pressure vessel hazards and their control, Safety in material handling: hazards and safe Practices, safety with storage of materials

Unit 4: Disaster Management Plans- Onsite Plans Standard operating procedures, control room, safety officer, Different committees for Disaster management, rescue team, training, exercises and mock drills, Offsite Plans- Dissemination of information, identification of vulnerable locations, need and damage assessment, rescue and relief plans, compensation

Suggested Readings

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Hazardous Materials Disaster Management-Arun kumar Talwar, Commonwealth Publisher
3. Heinrich H.W. "Industrial Accident Prevention" McGraw-Hill Company, New York, 1980 "Safety in Industry" N.V. Krishnan Jaico Publisher House, 1996

PAPER 5: RISK ASSESSMENT & VULNERABILITY ANALYSIS

CONTENT:

Unit 1: Introduction- Hazard, Risk and Vulnerability, Risk Concepts, Elements of Risk, Perception of Risk, Acceptable risk, Requirements in Risk assessment

Unit 2: Risk Assessment & Reduction- Risk Reduction- Mainstreaming “Risk”, Role of science and technology in Disaster Risk Reduction, Strategies of Risk reduction, International Mobilization of Risk reduction, Risk analysis techniques- Process of Risk assessment, Analytical systems for risk assessment, Natural hazard/ risk assessment, understanding climate risk, Mapping of risk assessment, Decision making for risk reduction, Problems in risk assessment, Participatory risk assessment: Rationale for people’s participation, Role of civil society organizations, Impact of Globalization, Activities and roles for the community action Risk reduction, Participatory risk assessment, Methods, Vulnerability analysis and Risk assessment: Addressing Semantics, Approaches to vulnerability Analysis, Models of Vulnerability analysis, Quantification of vulnerability, Assessment of Risk Vulnerability and capacity analysis (VCA), Vulnerability of Himalayan Eco-system, Hazard mapping using GIS, Use of remote sensing and GIS for risk assessment, multi hazard risk analysis using GIS.

Unit 3: Vulnerability- Observation and perception of vulnerability- Vulnerability Identification, Vulnerability types and dimensions, Vulnerability- Social factors and economic factors, Vulnerability to shanty settlements- Vulnerability in the city, Risk in Urban areas, Issues in urban planning, Initiatives for risk reduction in India

Unit 4: Strategic development for Vulnerability reduction- Physical & Social infrastructure for Vulnerability reduction, Interactive areas for Vulnerability reduction & Policy making, Hazard resistant designs and construction, System management Strategic planning for vulnerability reduction

Suggested Readings

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Disaster Management- G.K Ghosh-A.P.H. Publishing Corporation
3. Disaster management – S.K. Singh, S.C. Kundu, Shobha Singh A – 119, William Publications, New Delhi.
4. Disaster Management – Vinod K Sharma- NIDM, New Delhi
5. Disaster Risk Reduction in South Asia- by Pradeep Sahni - Prentice – Hall of India
6. Disaster Mitigation and Management Post – Tsunami Perspectives P, Jagadish Gandhi
7. Disaster Mitigation – Experiences and reflections – By Pradeep sahani - Prentice – Hall of India

SEMESTER II

PAPER 1: DISASTER PREPAREDNESS

CONTENT:

Unit 1: Introduction- Disaster Management Cycle, Disaster Preparedness: concept and significance, Disaster Preparedness Measures, Institutional Mechanism for Disaster Preparedness, Disaster preparedness with special needs/ vulnerable groups, Disaster Preparedness: Policy and Programmes

Unit 2: Disaster Preparedness Plan- Concept and Significance, Disaster Preparedness Plan essentials, Community Based Disaster Preparedness plan

Unit 3: Disaster Preparation- Material, relief required- sources of relief, modes and means of transport, medical facility and communication network, Preparation of manpower, awareness of damages, perception, reaction time. Authority: Hierarchy set-up, direction of communication, Hazard monitoring, tracking and modelling, Early warning systems, warning protocols, India Disaster Resource Network, Emergency Sanitation/Shelter environments, worst scenario analysis, Emergency operation Centre, Role of Information, Education, Communication and Training

Unit 4: Emerging Technologies in Disaster Management- Remote sensing, Disaster Mapping, Aerial Photography, land use zoning, Wireless and Radio, HAM radio

Suggested Readings

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Natural Hazards and Disaster Management: Vulnerability And Mitigation - R B Singh- Rawat Publications
3. Disaster Management- G.K Ghosh - A.P.H. Publishing Corporation
4. Disaster management – S.K. Singh, S.C. Kundu, Shobha Singh A – 119, William Publications, New Delhi.
5. Disaster Management – Vinod K Sharma- IIPA, New Delhi,1995

PAPER 2: DISASTER RESPONSE

CONTENT:

Unit 1: Introduction- Essential Components of Disaster Response, Disaster Response Plan, Resource Management- Financial, Medical, equipment's, communication, Human, transportation, Food and essential commodity (Identification, Procuring, Propositioning and deployment), Directing and controlling functions, Communication, Participation & activation of Emergency Preparedness Plan, Logistics Management, Emergency support functions, Need and damage assessment

Unit 2: Coordination in Disaster Response- Disaster response organization, Disaster response & administration - Central, State, District and Local, Disaster Response: Policy & Other organization, Role of multiple stakeholders in Disaster Response NDRF, SDRF, ITBP, CRPF, SRPF, EMS

Unit 3: Quick Disaster Response- First responder, medical first aid, life saving techniques, Golden time, Search & Rescue equipments- Search & Rescue equipments for different disasters, its use, procurement, maintenance, Search & Rescue Teams- Warning teams, evacuation teams, medical support, logistic management & other teams. Individual and Group behavior, Psychological Response, Trauma & Stress Management, Rumor & Panic Management

Unit 4: Relief Measures- Relief measures, Minimum standards of relief, managing relief, Funding relief, Recovery

Suggested Readings

1. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
2. Disaster Planning and Recovery- Levitt, Alan M - John Valley and Sons, New York, 1997.
3. National Disaster Response Plan - Ministry of Agriculture and Cooperation, Government of India, New Delhi: 2002
4. National Disaster Response Plan, NCDM, New Delhi, 2001
5. Disaster management – S.K. Singh, S.C. Kundu, Shobha Singh A – 119, William Publications, New Delhi.
6. Disaster Management – Vinod K Sharma- NIDM, New Delhi

PAPER 3: RECOVERY, RECONSTRUCTION AND REHABILITATION

CONTENT:

- Unit 1:** Rehabilitation, Reconstruction and Development- Reconstruction Rehabilitation and Development- Concept, Meaning, types of Rehabilitation and Reconstruction, Importance of Disaster Mitigation, Cost – benefit analysis, relationship between vulnerability and development, Damage Assessment- Post Disaster Damage assessment, estimated damage assessment due to probable disasters, Sample Surveys, Epidemiological Surveillance, Nutrition Centered Health Assessment, Remote sensing and Aerial photography, nature and damage to houses and infrastructure due to different disasters, Role of Different organization in Rehabilitation, The Government and Disaster Recovery and rehabilitation; Disaster and Non-governmental efforts; Role of Local Institutions; Insurance, Police, Media
- Unit 2:** Reconstruction- Speedy Reconstructions- Essential services, Social infrastructures, immediate shelters/camps, Contingency plans for reconstructions. Development of Physical and Economic Infrastructure- Developing Physical and Economic Infrastructure, Environmental Infrastructure development, Disaster resistant House Construction- Guidelines for Disaster resistant construction, traditional techniques, Seismic strengthening of houses in low rain/High rainfall area, earthquake resistant construction technique. Funding arrangements- Funding arrangements at state level and central level, Fiscal discipline, role of International agencies, mobilization of community for resource generation
- Unit 3:** Rehabilitation- Socio- economic Rehabilitation- Temporary Livelihood Options and Socio-Economic Rehabilitation, Role of Housing / building authorities- Education and awareness and role of Information Dissemination, Participative Rehabilitation, Role of various agencies in Recovery Work- Monitoring and evaluation of rehabilitation work, Rehabilitation process
- Unit 4:** Recovery- Concept of recovery, livelihood and approach to reconstruction, Livelihood restoration, Speedy recovery, Linking Recovery with safe development, Creation of Long-term job opportunities

Suggested Readings

1. Asian Development Bank, Disaster Mitigation in Asia and the Pacific, Manila ADB, 1991.
2. Disaster Administration and Management, Text & Case studies- SL Goel-Deep and Deep Publications
3. Disaster Management- G.K Ghosh-A.P.H. Publishing Corporation
4. Disaster management – S.K. Singh, S.C. Kundu, Shobha Singh A – 119, William Publications, New Delhi.
5. Disaster Management – Vinod K Sharma- IIPA, New Delhi,1995
6. Encyclopaedia of Disaster Management- Goel S.L. - Deep and Deep Publications, New

Delhi, 2006.

7. Post-Earthquake Rehabilitation and Reconstruction, F.Y. Cheng, Y.Y. Wang, Permagon Publications

PAPER 4: INDUSTRIAL SAFETY MANAGEMENT

CONTENT:

Unit 1: Introduction- Need for safety, Safety legislation: Acts and rules, Factory Act 1948, Workman's Compensation Act, 1943, Employees State Insurance Act, 1948, Safety standards and codes, Safety policy: safety organization and responsibilities and authorities of different levels, Safety Management

Unit 2: Training for Safety- Importance of training-identification of training needs-training methods – programmes, seminars, conferences, competitions – method of promoting safe practice - motivation – communication - role of government agencies and private consulting agencies in safety training – Safety awareness, Employee Participation, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign – Domestic

Unit 3: Accident Investigation and Reporting- Concept of an accident, reportable and non-reportable accidents, reporting to statutory authorities – principles of accident prevention – accident investigation and analysis – records for accidents, departmental accident reports, documentation of accidents – unsafe act and condition –supervisory role – role of safety committee –cost of accident.

Unit 4: Safety Performance Monitoring and Audit- Safety Performance Monitoring- ANSI (Z16.1) Recommended practices for compiling and measuring work injury experience-permanent total disabilities, permanent partial disabilities, temporary total disabilities - Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate, safety "t" score, safety activity rate –problems. Safety Audit-Components of safety audit, types of audit, audit methodology, non conformity reporting (NCR), audit checklist and report – review of inspection, remarks by government agencies, consultants, experts – perusal of accident and safety records, formats – implementation of audit indication - liaison with departments to ensure co-ordination – check list – identification of unsafe acts of workers and unsafe conditions in the shop floor

Suggested Readings

1. Heinrich H.W. "Industrial Accident Prevention" McGraw-Hill Company, New York, 1980.
2. Krishnan N.V. "Safety Management in Industry" Jaico Publishing House, Bombay, 1997
3. Dan Petersen, "Techniques of Safety Management", McGraw-Hill Company, Tokyo, 1981.
4. Blake R.B., "Industrial Safety" Prentice Hall, Inc., New Jersey, 1973
5. Slote. L. Handbook of Occupational Safety and Health, John Willey and Sons, New York

PAPER 5: FINANCE AND INSURANCE IN DISASTER MANAGEMENT

CONTENT:

Unit 1: Introduction to Banking & Finance- Concept of Banking, Types of banks, Functions of banks; Tax administration; Public budgeting and finance systems; State and local finances.

Unit 2: Central Bank / Reserve Bank- Role and function of central bank, RBI and Monetary Policy

Unit 3: Introduction to Insurance- Evolution and Features of Insurance, Classification of Insurance, Conditions relating to risk, selection or Risk

Unit 4: Life Insurance & General Insurance- Principles of LIC, Privatization of Life Insurance Business, Role and performance of LIC, Nonlife insurance – Fire, Automobile, Marine, Health, Rural, Social and miscellaneous insurances.

Unit 5: Insurance Policies for Disaster Management- Evaluation of risk funding and risk transfer policies; Catastrophe insurance pool; Reserve funds and contingent credit policies; Role of Government and market participants; Insurance policy design; Fiscal cost of relief and reconstruction; Grants and low interest loan for reconstruction.

Suggested Readings:

1. Money, Banking & Public Finance – T.N. Hajela- Ane Books Pvt Ltd-8th Edition.
2. Banking and Financial Markets in India – Bhasin Niti-New Century Publications-1947 to 2007.
3. Banks & Institutional Management- Vasant Desai-Himalaya PublishingHouse-1st Edition.
4. Banking theory and practices – K.C. Shekhar, Lekshmy Shekhar – Vikas Publishing House-19th Edition.
5. Insurance principles & practice –M.N. Mishra, S.B. Mishra -S. Chand Publication- 17th Edition
6. Life Insurance in India- H. Sadhak (Response Books) 1stEdition
7. Insurance in India- P.S. Palande, R.S. Shah, M.L. Lunawat (Response Books) 6th Edition
8. National Disaster Response Plan, NCDM, New Delhi, 2001.