ఆంధ్రప్రదేశ్ కేంద్రీయ విశ్వవిద్యాలయం

आंध्रप्रदेश केंद्रीय विश्वविद्यालय

Central University of Andhra Pradesh

Jnana Seema, Ananthapuramu

School of Arts, Humanities and Social Sciences

Department of Geography & Geoinformatics

Vidya Dadati Vinayam
(Education Gives Humility)

PG Diploma in Disaster Management

w.e.f. Academic Year 2025-26

Contents

PG Diploma in Disaster Management

Introduction to the Programme

The **PG Diploma in Disaster Management** is designed to prepare professionals to effectively handle disasters through comprehensive training in preparedness, response, recovery, and mitigation. The course covers risk assessment, emergency planning, climate change adaptation, and post-disaster rehabilitation, with a focus on practical skills and community-based approaches. Integrating modern tools like GIS and remote sensing, the program also addresses national and international disaster management policies. Graduates will be equipped to work in government agencies, NGOs, and the private sector, contributing to disaster risk reduction and building resilient communities. This course is ideal for those committed to managing and reducing disaster impacts.

Programme Objectives:

- Equip students with a comprehensive understanding of disaster management concepts, types of hazards, and risk reduction strategies.
- Train learners in emergency planning, disaster response techniques, and recovery operations using modern tools and technologies.
- Foster skills to engage communities in disaster preparedness, response, and rehabilitation efforts.
- Teach application of GIS, remote sensing, and early warning systems in disaster management planning and response.
- Familiarize students with national and international frameworks, policies, and best practices in disaster risk reduction.

Programme Outcome:

- Graduates will be able to design and implement disaster management plans across all phases—preparedness, response, recovery, and mitigation.
- Ability to apply GIS, remote sensing, and risk assessment tools in disaster analysis and management.
- Knowledge of disaster management policies, frameworks, and institutional mechanisms at national and global levels.
- Capacity to work with communities, promoting awareness and strengthening local disaster resilience.
- Prepared to work in government agencies, NGOs, disaster response organizations, and development sectors.

Programme Structure

Sl. No.	Course Code	Title of the Course	Credit Points	Credit Distribution		
				L*	T*	P*
Semester I						
1	PDDIM101	Environmental and Occupational Hazards	4	4	-	-
2	PDDIM102	Disaster Management	4	4	-	-
3	PDDIM103	Geoinformatics for Disaster Management	4	4	-	-
4	PDDIM104	MOOC	3	3	-	-
5	PDDIM105	MOOC	3	3	-	-
6	PDDIM106	Practical: Geoinformatics for Disaster Management	2	-	-	2
Total			20	-	-	-
Semester II						
1	PDDIM201	Adaptation, Resilience, and Disaster Recovery	4	4	-	-
2	PDDIM202	Case Studies on Disaster Management	4	4	-	-
3	PDDIM203	MOOC	3	3	-	-
4	PDDIM204	MOOC	3	3	-	-
5	PDDIM205	*Project Work	6	-	-	6
Total			20			

***** Project Work is compulsory and have to submit to the department one week before second semester examination. Department faculty will allot a supervisor to each student at the end of first semester.

***L:** Lectures, ***T**: Tutorials, ***P**: Practical

Note: 1. MOOCs are chosen by the student based on the availability of the courses offered on SWAYAM & other related platforms as suggested/recommended by the Department.

2. The desired changes may be made by the Department in the programme structure as and when necessary with the prior approval of the BOS.

Credit Distribution

Semester	Total Credits
Semester-I	20
Semester-II	20
Total	**40**

Important Information to the Student

1. Eligibility:
   - **i.** CUAP/Non-CUAP students pursuing/completed any PG/PhD Programmes can enroll for PG Diploma Programme offered by the University.
   - **ii.** Non-CUAP students shall have to appear for an Entrance Examination conducted by the University.
   - **iii.** A student can enroll for as many PG Diploma Programmes as he/she wishes.

2. The minimum duration for completion of any Postgraduate Diploma Programme is two semesters (one academic year).
3. Maximum duration of completion of programme is two years.
4. A student should have a minimum 75% attendance in classes, seminars, practical/ lab in each course of study, without which he/she will not be allowed for the Semester -end examination.
5. All theory courses in the programme shall have a Continuous Internal Assessment (CIA) component of 40 marks and a Semester-end component of 60 marks. The minimum pass mark for a course is 50%.
6. The student has to appear 3 CIA tests of 15 marks each per semester in each course, from which the best 2 performances shall be considered for the purpose of calculating the marks. A record of the continuous assessment is maintained by the department. The remaining 10 marks are awarded based on participation and performance in:
   - Assignments
   - Class presentations
   - Seminars
   - Quizzes
7. A student should pass separately in both CIA and the Semester-end Examination.
8. Semester-end examination shall consist of objective-type questions, descriptive-type questions, short-answer questions, and case studies or any others.
9. A student failing to secure the minimum pass marks in the CIA is not allowed to take the semester-end examination of that course. She/He has to redo the course by attending special classes for that course and get the pass percentage in the internal tests to become eligible to take the semester-end examination.
10. Students failing a course due to lack of attendance should redo the course.

Semester - I

Course: Core **Course Code: PDDIM101** **Total Hours: 60**	**Environmental and Occupational Hazards**

Course Objectives:

This course aims to provide learners with a comprehensive understanding of environmental and occupational hazards, including natural disasters, physical, chemical, and biological risks and sector-specific occupational exposures. It equips students with the ability to recognize hazards, assess associated health impacts, and apply mitigation, prevention, and safety management strategies to promote environmental protection and workplace health and safety.

Learning Outcomes:

- Explains the nature, causes, and impacts of major natural hazards and disasters, and understands the factors influencing disaster risk.
- Identify and differentiate between physical, chemical, and biological environmental hazards and describe their effects on human health.
- Describe key occupational hazards in mining, construction, agriculture, and forestry sectors, including zoonotic and ergonomic risks.
- Recognize the major occupational hazards in healthcare and corporate sectors, including bioterrorism, biomedical waste, and ergonomic or psychological risks.
- Apply principles of mitigation, prevention, and integrated hazard management to reduce environmental and occupational risks effectively.

Course Outlines:

Unit I: Natural Hazards and Disasters **12 Hours**

- Introduction to natural hazards and disasters
- Impacts of natural hazards and disasters: Earthquakes and Tsunamis, Volcanoes, Floods, Droughts, Landslides, cyclones, Tornados, and Thunderstorms

Unit II: Environmental Physical, Chemical & Biological Hazards **12 Hours**

- Physical Hazards: Extreme temperature, Noise and Vibration, Radiation
- Chemical Hazards: Flammable chemical materials, Corrosive chemical materials, Chemical toxins
- Biological Hazards: Bacteria, viruses, fungi

Unit III: Occupational Hazards in Primary and Industrial Sectors **12 Hours**

- Occupational health hazards in mining
- Occupational health hazards in construction
- Occupational hazards in agriculture and allied sectors: physical and chemical hazards
- Zoonotic diseases
- Occupational hazards in forestry

Unit IV: Occupational Hazards in Healthcare and Corporate Sectors **12 Hours**

- Biological warfare and bioterrorism
- Hazards faced by healthcare workers: physical, biological, and chemical
- Healthcare waste and biomedical waste
- Corporate and office hazards: ergonomic and psychological

Unit V: Mitigation, Safety, and Hazard Management **12 Hours**

- Mitigation of physical hazards
- Mitigation of biological hazards
- Mitigation of chemical hazards
- Prevention and control strategies
- Integrated hazard and safety management

References:

1. Gupta, H. K. (2013). *Natural Hazards and Disaster Management*. New Delhi: Wiley India.
2. Sharma, V. K. (2015). *Natural Hazards and Disaster Management: Vulnerability and Mitigation*. New Delhi: Concept Publishing.
3. Goel, S. L. (2010). *Environment and Disaster Management*. New Delhi: Deep & Deep Publications.
4. Goetsch, D. L. (2014). *Occupational Safety and Health for Technologists, Engineers, and Managers*. Upper Saddle River: Pearson.
5. K. U. Mistry. (2018). *Industrial Hazards and Safety Handbook*. Mumbai: Nirali Prakashan.
6. Lees, F. P. (2012). *Loss Prevention in the Process Industries*. Oxford: Butterworth-Heinemann.

Course: Core Course Code: PDDIM102 Total Hours: 60	Disaster Management

Course Objective:

The course aims to equip students with foundational and advanced knowledge of disaster management concepts, principles, and practices. It focuses on understanding types of disasters, their causes, impacts, and the mechanisms for effective preparedness, response, mitigation, and recovery. The course develops skills in risk assessment, emergency planning, and disaster resilience-building, enabling learners to contribute effectively to disaster risk reduction and sustainable development across sectors.

Learning Outcomes:

- Understand key disaster concepts, management phases, and India's disaster management evolution to analyze how development influences vulnerability.
- Gain clarity on India's disaster governance structure, including NDMA, SDMA, NIDM, and key legal and policy frameworks.
- Recognize how disasters impact vulnerable groups and understand essential principles of psychosocial care, equity, and social inclusion.
- Learn the roles of major response agencies, early warning systems, and essential practices for emergency relief and logistics.
- Develop the ability to apply DRR strategies, community participation, capacity building, and recovery planning to enhance resilience.

Course outline:

Unit I: Fundamentals of Disaster Management **12 Hours**

- Disaster: Concepts and Types
- Disaster Management: Issues, Phases, and Approaches
- Evolution of Disaster Management in India
- Relationship Between Disasters, Development, and Vulnerabilities

Unit II: Disaster Management Frameworks in India **12 Hours**

- Disaster and Disaster Management in India
- National Disaster Management Authority, SDMA & Local Bodies
- National Institute of Disaster Management (NIDM)
- Legal and Policy Framework of Disaster Management in India (DM Act, 2005; Policies & Guidelines)

Unit III: Social Dimensions and Vulnerabilities in Disasters **12 Hours**

- Impact of Disasters on Vulnerable Groups: Refugees, Women, Children, Elderly & Persons with Disabilities
- Psychosocial Care, Trauma, and Mental Health During Emergencies
- Equity Issues in Disasters
- Gender, Social Justice, and Inclusion in Disaster Response

Unit IV: Disaster Response Mechanisms and Stakeholders **12 Hours**

- Institutional Mechanisms for Disaster Response
- Stakeholders in Disaster Relief Management: Central & State Government, district Administration, Armed Forces, Para-Military Forces, fire Services, NGOs, CSOs, and Community Institutions
- Early Warning Systems and Communication Technologies
- Emergency Relief, Evacuation, and Logistics Management

Unit V: Disaster Risk Reduction, Recovery, and Resilience **12 Hours**

- Disaster Risk Reduction (DRR) Strategies and Sendai Framework
- Community-Based Disaster Management (CBDM)
- Capacity Building and Training for Disaster Preparedness
- Rehabilitation, Reconstruction, and Long-Term Recovery
- Planning for Future Disasters and Building Resilient Communities

References:

- Gupta, H. K. (2003). *Disaster management*. Hyderabad: Universities Press.
- Alexander, D. (2000). *Natural disasters*. Routledge.
- Government of India. (2009). *National Policy on Disaster Management*. New Delhi: Ministry of Home Affairs.
- Government of India. (2016). *National Disaster Management Plan*. New Delhi: National Disaster Management Authority.
- Shaw, R. (Ed.). (2013). *Disaster recovery: Used or misused development opportunity*. Springer.
- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: Natural hazards, people's vulnerability and disasters* (2nd ed.). Routledge.
- Shaw, R. (Ed.). (2012). *Community-based disaster risk reduction*. Emerald Group Publishing.
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *Vulnerability: Why disasters happen*. Routledge.
- Schneid, T. D., & Collins, L. (2001). *Disaster management and preparedness*. CRC Press.
- Smith, K. (2013). *Environmental hazards: Assessing risk and reducing disaster* (6th ed.). Routledge.

Course: Core Course Code: PDDIM103 Total Hours: 60	Geoinformatics for Disaster Management

Course Objective:

This course aims to equip learners with foundational and applied knowledge of geoinformatics tools, including GIS, GPS, remote sensing, and WebGIS, for effective disaster management. Students will learn to analyze spatial data, assess risks, and support decision-making processes during all phases of disaster management—preparedness, response, recovery, and mitigation—using geospatial technologies for accurate mapping, monitoring, and strategic planning in disaster-prone regions.

Learning Outcomes:

- Understand GIS concepts, data types and models, data collection methods, coordinate systems, GPS, and database management for spatial data.
- Understand principles of electromagnetic radiation, digital image interpretation, resolution, errors, RS platforms, and integration of RS with GIS.
- Apply basic and advanced spatial analysis techniques using GIS software, including data integration, digitization, attribute management, and environmental hazard applications.
- Map and assess hazards such as floods, droughts, forest fires, and atmospheric pollution using geoinformatics tools for risk visualization.
- Use GIS and RS for disaster preparedness, vulnerability and risk mapping, community-based hazard planning, response, recovery, and Indian disaster case studies.

Course Outline:

Unit I: Fundamentals of GIS and Data Representation **12 Hours**

- Introduction to GIS and its Applications
- Data Types, Data Models, and Advanced Data Models
- Data Generation, Collection, and Surveys
- Coordinate Systems, Map Projections, and Global Positioning Systems (GPS)
- Databases and Database Management Systems (DBMS)

Unit II: Basics of Remote Sensing **12 Hours**

- Electromagnetic Radiation and Energy Interaction with Atmosphere and Surface
- Digital Images, False Color Composites, and Resolution
- Errors and Limitations in Remote Sensing
- Remote Sensing Platforms and Sensors (Satellite, Aerial, UAVs)
- Integration of Remote Sensing with GIS

Unit III: Spatial Analysis and GIS Software Tools **12 Hours**

- Basic and Advanced Spatial Analysis Techniques
- GIS Software Tools: Quantum GIS (QGIS) Introduction
- Hands-on Working with Maps: Data Integration, Digitization, and Extraction
- Attribute and Spatial Data Management in GIS
- Practical Applications in Environmental and Hazard Analysis

Unit IV: Geoinformatics for Hazard Analysis **12 Hours**

- Introduction to Geoinformatics for Hazard and Risk Analysis
- Flood Hazard Mapping and Risk Assessment
- Drought Hazard Mapping and Assessment
- Forest Fire Hazard Analysis
- Atmospheric and Pollution Hazard Analysis

Unit V: GIS and Remote Sensing in Disaster Management **12 Hours**

- Role of GIS and RS in Disaster Preparedness and Early Warning
- GIS-Based Vulnerability and Risk Mapping
- Integration of GIS and RS in Disaster Response and Recovery
- Community-Based Hazard Mapping and Local Planning
- Case Studies: Application of GIS and RS in Indian Disasters

References:

- Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). *Remote sensing and image interpretation* (7th ed.). Wiley.
- Chang, K. T. (2019). *Introduction to geographic information systems* (9th ed.). McGraw-Hill Education.
- Roy, P. S. (2010). *Geoinformatics in natural resource management*. Oxford University Press.
- Bhatta, B. (2011). *Remote sensing and GIS* (2nd ed.). Oxford University Press.

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Course: Core **Course Code: PDDIM106** **Total Hours: 60**	**Practical: Geoinformatics for Disaster Management**

Course Objectives:

This course aims to provide students with foundational knowledge and practical skills in Geographic Information Systems (GIS) and basic Remote Sensing (RS) for hazard analysis and disaster management. Students will learn to collect, process, and analyze spatial data, generate hazard and risk maps, and apply GIS and RS tools to support disaster preparedness, response, and community-based risk reduction in the Indian context.

Learning outcomes:

- Use GIS software to create, manage, and analyze vector and raster data, including coordinate systems, map projections, and GPS integration.
- Import, visualize, and enhance satellite images, and overlay RS data with GIS layers for basic spatial analysis.
- Perform spatial operations, create maps with symbology and labeling, and integrate survey or GPS data into GIS.
- Map hazard-prone areas such as floods, droughts, forest fires, and pollution, and generate simple hazard risk maps.
- Create vulnerability and risk maps, integrate field data for community-based hazard mapping, and prepare reports and presentations for Indian disaster case studies.

Course Outline:

Unit I: Fundamentals of GIS **12 Hours**

- Introduction to GIS software – creating and managing vector and raster layers
- Coordinate systems, map projection exercises, and basic GPS data integration
- Attribute table management, simple digitization, and data entry

Unit II: Basics of Remote Sensing **12 Hours**

- Importing and visualizing satellite images (e.g., Landsat, Sentinel)
- Basic image enhancement and false color composites
- Overlaying RS data with GIS layers for simple analysis

Unit III: Spatial Analysis and GIS Tools **12 Hours**

- Basic spatial operations: Buffer, clip, overlay
- Simple map layout, symbology, and labeling
- Integrating survey or GPS data with GIS layers

Unit IV: Geoinformatics for Hazard Analysis **12 Hours**

- Mapping flood- and drought-prone areas using GIS
- Mapping forest fire and pollution/atmospheric hazards
- Generating simple hazard risk maps for visualization

Unit V: GIS and RS in Disaster Management Applications **12 Hours**

I. Creating vulnerability and risk maps using GIS layers
II. Field data collection and integration for community-based hazard mapping
III. Report preparation and presentation of maps for Indian disaster case studies

References:

- Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). *Remote sensing and image interpretation* (7th ed.). Wiley.
- Chang, K. T. (2019). *Introduction to geographic information systems* (9th ed.). McGraw-Hill Education.
- Roy, P. S. (2010). *Geoinformatics in natural resource management*. Oxford University Press.
- Bhatta, B. (2011). *Remote sensing and GIS* (2nd ed.). Oxford University Press.
- Campbell, J. B., & Wynne, R. H. (2011). *Introduction to Remote Sensing* (5th Edition). New York: Guilford Press.

Semester - II

Course: Core **Course Code: PDDIM201** **Total Hours: 60**	**Adaptation, Resilience, and Disaster Recovery**

Course Objective:

To develop a comprehensive understanding of disaster response and crisis communication. The course focuses on designing occupation-specific systems and communication flowcharts to guide effective interventions. It also emphasizes creating social media communication models for disaster scenarios, recognizing personal trauma, and initiating healing processes. Additionally, the course aims to build essential life and safety skills for effective disaster management practice.

Course outcomes:

- Understand the role of disaster communication, DMIS, media, and community knowledge in India.
- Develop and evaluate disaster response plans, resource management, ICS, and EOC operations in India.
- Assess psychological impacts and implement mental health and community-based interventions during disasters.
- Analyze post-disaster recovery, rehabilitation, policy frameworks, and community-based strategies in India.
- Apply DRR principles, Sendai Framework strategies, capacity building, and community resilience planning in India.

Course outline:

Unit I: Disaster communication **12 Hours**

- Importance of Communication in Disasters.
- Types of Communication: Radio, Satellite, Mobile Networks, Video Conferencing
- Information Flow & Disaster Management Information Systems (DMIS)
- Role of Media: News Media, Social Media, Public Communication
- Indigenous Knowledge, Community Communication & Crisis/Rumor Management

Unit II: Disaster response: **12 Hours**

- Disaster Response: Overview, Importance & Key Elements
- Response Plan Development: Protocols, Activation Mechanisms & Coordination
- Resource Management: Financial, Medical, Human, Logistics & Essentials
- Incident Command System (ICS) & Unified Response Mechanisms
- Emergency Operations Centres (EOC): Structure, Functions & Operations

Unit III: Psychological Response and Management **12 Hours**

- Psychological Responses: Trauma, Stress, Panic & Rumor Behavior
- Psychosocial Support & Mental Health Interventions
- Medical & Public Health Responses Across Disaster Types
- Psychological First Aid (PFA) & Community-Based Support
- Ethical Issues in Mental Health Care During Disasters

Unit IV: Post-Disaster Recovery and Rebuilding: **12 Hours**

- Recovery & Rebuilding: Concepts, Objectives & Key Components
- Resettlement and Rehabilitation in Post-Disaster Context
- Disaster Recovery Policies, Processes & Institutional Frameworks
- Community-Based Disaster Response & Local Recovery Strategies
- Damage and Loss Assessment (DaLA) & Post-Disaster Needs Assessment (PDNA)

Unit V: Disaster Risk Reduction and Resilience **12 Hours**

- DRR: Principles, Practices & Strategies
- Sendai Framework for Disaster Risk Reduction
- Community-Based Disaster Risk Reduction (CBDRR)
- Capacity Building & Disaster Preparedness Initiatives
- Planning for Future Disasters, Public Awareness & Building Resilient Communities

References:

- Arefian, F. F. (2018). Organising Post-Disaster Reconstruction Processes. Springer.
- Erlene-Grise Owens, Justin Miller, Mindy Eaves. 2016. The A-to-Z Self-Care Handbook for Social Workers and Other Helping Professionals. New Social Worker Press.
- Lindell, M., Prater, C., and Perry, R. (2006). Fundamentals of Emergency Management, FEMA, Washington, DC.
- Paton, D. and Johnston, D. (2006). Disaster resilience: An integrated Approach. Charles C Thomas Pub Ltd .
- SaraKay Smullens. 2015. Burnout and Self-Care in Social Work: A Guidebook for Students and Those in Mental Health and Related Professions. NASW Press
- Thomas M. Skovholt and Michele Trotter-Mathison. 2011. The Resilient Practitioner: Burnout Prevention and Self-Care Strategies for Counsellors, Therapists, Teachers and Health Professionals. Routledge.

Course: Core Course Code: PDDIM202 Total Hours: 60	Case Studies on Disaster Management

Course Objective:

To critically examine real-world disaster events through case studies in order to understand the dynamics of disaster preparedness, response, recovery, and mitigation. The course aims to develop analytical skills by evaluating diverse disaster scenarios, identifying best practices and challenges, and drawing lessons that can inform future disaster risk reduction strategies and policy-making.

Learning Outcomes:

- Understand and apply systematic frameworks for analyzing disasters, including concepts of hazard, vulnerability, capacity, and resilience.
- Interpret global disaster case studies to evaluate diverse disaster impacts, response strategies, and factors influencing outcomes.
- Examine major Indian disaster case studies to assess causes, consequences, and the effectiveness of national response mechanisms.
- Compare multiple disaster events to identify common lessons, successful practices, and gaps in disaster management approaches.
- Integrate cross-case insights to propose improved strategies for preparedness, response, recovery, and building resilient communities.

Course Outline

Unit I: Framework for Case Study Analysis in Disaster Management 12 Hours

- Importance of case studies in disaster risk reduction and management
- Methodology for analysing disasters
- Concepts of hazard, vulnerability, capacity, and resilience
- International frameworks: Sendai Framework, Sphere Standards

Unit II: Global Case Studies 12 Hours

I. Nepal Earthquake (2015)

- Pakistan Floods (2022)
- Hurricane Katrina (2005)
- East Africa Drought (2011)
- Mount Pinatubo Volcanic Eruption (1991)

Unit III: National (Indian) Case Studies 12 Hours

- Indian Ocean Tsunami (2004), Gujarat Earthquake (2001), Uttarakhand Flash Flood (2013)
- Phailin Cyclone (2013), Super Cyclone Odisha (1999), Uttar Kashi Earthquake (1991)
- Bhopal Gas Disaster (1984), Major Landslide Disasters, Atmospheric/SARS Outbreak (2002–04)
- Balasore Train Accident (2023), Firozabad Rail Accident (1995)
- Amri Hospital Fire (2011)

Unit IV: Cross-Case Insights and Comparative Learning **12 Hours**

- Cross-case comparative analysis: successes, failures, and patterns
- Role of community-based disaster response: NDRF, NGOs, UN agencies, local government
- Critical lessons for preparedness, mitigation, and adaptive planning

Unit V: Integrated Learning and Future Directions **12 Hours**

- Applying lessons across disasters for strengthening DRR planning
- Building Back Better (BBB): resilience, reconstruction, rehabilitation frameworks
- Best practices for future preparedness, policy improvement, and community resilience

References:

- Rajib Shaw & R. Krishnamurthy (2009) Disaster Management: Global Challenges and Local Solutions, University Press.
- Pelling, M. and Winser, B. (2008) Disaster Risk Reduction: Cases from Urban Africa, Routledge.
- Coppala, D. P. (2015). Introduction to International Disaster Management, Butterworth-Heinemann
- Singh, R.B. (2006) Natural Hazards and Disaster Management, Rawat Publications.