

**Himalayan Centre for Disaster Risk Reduction and
Resilience
(HIM-DRRR)**

**Plan, Scheme, and Syllabus
Post Graduate Diploma Programme
in**

Disaster Risk Reduction and Management (DRRM)
(Effective for the Batch 2026-2027 and onwards)



**Himalayan Centre for Disaster Risk Reduction and
Resilience
(HIM-DRRR)**

Himachal Pradesh University
(NAAC Accredited “A” Grade University)
Summerhill, Shimla-171005
Himachal Pradesh, India

Programme Details

Name of the Programme	Post Graduate Diploma Programme in Disaster Risk Reduction and Management (DRRM)
Offering Centre	Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DR ³), Himachal Pradesh University, Shimla
Academic Session	Effective for the Batch 2026-2027 and onwards
Minimum Eligibility	Graduation in any discipline with 50% (45% for SC/ST/OBC/PwD) marks
Total Credits	40 credits
Programme Mode	Regular (Choice Based Credit System)
Medium of Instruction	English

Programme Overview

The Postgraduate Diploma Programme in Disaster Risk Reduction and Management (DRRM) is offered by the Himalayan Centre for Disaster Risk Reduction and Resilience (HIM-DRRR), Himachal Pradesh University, Shimla. The programme is designed to develop professional knowledge, analytical ability and applied skills required for careers in disaster risk reduction, preparedness, response, recovery and resilience building.

The syllabus is structured in accordance with the academic requirements of Himachal Pradesh University for implementation by the Centre.

Programme Objectives

1. To develop conceptual knowledge with an integrated approach to the various functions of the disaster cycle.
2. To develop effective communication and presentation skills required to become a successful professional.
3. To analyse and apply research and analytical skills in decision-making.
4. To demonstrate skills of organizing, planning, controlling, team-building and leadership in challenging disaster-management environments.
5. To apply concepts, theories and models in disaster risk reduction, disaster prevention, disaster response and rehabilitation.
6. To prepare professionals in the field of disaster management.

Minimum Eligibility for Admission

- Bachelor's Degree or equivalent in any discipline from a recognized University/Institution shall be eligible for admission.
- Minimum 50% marks in aggregate or equivalent CGPA (45% for SC/ST/OBC/PwD candidates as per university norms)
- Admission shall be based on the University's norms and regulations notified from time to time in HBI.
- Reservation policy, fee structure, and documentation requirements shall follow HPU rules.

Basis of Admission

Admission to the Postgraduate Diploma Programme in Disaster Risk Reduction and Management (PG-DRRM) shall be made on the basis of merit in the Qualifying Examination (Bachelor's Degree). All other rules and regulations governing admission shall be as per the provisions prescribed in the Handbook of Information (HBI), Himachal Pradesh University (HPU), Shimla, as amended from time to time.

Scheme of Examination

English shall be the medium of instruction and examination. The pass marks in each course shall be 40% in each written paper and in the internal assessment separately, and 40% in viva-voce, project work and semester course and 50% in the aggregate subject to the conditions that the aggregate shall be determined at the end of the examination. Other rules shall be as per the rules of the university

a. Theory Papers: Each paper will be of 100 marks (70 marks for the theory exam and 30 marks for internal assessment), and the duration of each paper will be 3 hours. In respect of theory papers, 30 marks in each paper shall be reserved for the award of internal assessment based on such work as assignments/practical/periodical tests/quiz etc.

Medium of Instruction

English will be the medium of instruction and examination.

Fee Structure

Rs 15000 per semester

Duration of Program

1 year

Number of Seats

20

Programme Structure

Broad Category	Category	Course Code	Course Title	L	T	P	C	Semester End Marks	
								ESE	IA
SEMESTER – I									
PCC	Major	PCC-DRRM-101	Introduction to Disaster Management	3	1	0	4	70	30
PCC	Major	PCC-DRRM-102	Hazard Vulnerability and Risk Assessment	3	1	0	4	70	30
RBC	Major	RBC-RM-101	Research Methodology and Ethics	3	0	0	3	70	30
PCC	Major	PCC-DRRM-104	Emergency, Humanitarian and Incident Response System	3	1	0	4	70	30
PCC	Major	PCC-DRRM-105	Disaster Governance, Policy and Institutional Frameworks	3	1	0	4	70	30
PCC	Major	PCC-DRRM-106	Disaster Preparedness and Life-Saving Skills	0	0	4	2	50	50
SEMESTER – II									
PCC	Major	PCC-DRRM-201	Emerging Technologies, AI Applications and Field-Based Resilience Planning	3	1	0	4	70	30
PCC	Major	PCC-DRRM-202	Geoinformatics in Disaster Management	3	1	0	4	70	30
PCC	Major	PCC-DRRM-203	Financial Resilience and Risk Transfer	4	0	0	4	70	30
PCC	Major	PCC-DRRM-204	Geospatial Techniques for Emergency Management	0	0	4	2	50	50
PCC	Major	PCC-DRRM-205	Internship	-			5	100	50
Total Credits				25	6	8	40	760	390
								1150	

Abbreviations:

PCC- Programme Core Course

RBC- Research Based Course

Name of the Course		Introduction to Disaster Management	
Course Code: PCC-DRRM-101	Credits - 4, MM: 70	L-3, T-1, P-0	
		Internal Assessment: 30	
Course Objectives ● To provide a comprehensive understanding of disaster concepts, hazards, vulnerabilities, and disaster management principles. ● To develop knowledge of disaster risk reduction strategies and community-based approaches. ● To introduce disaster management applications, assessment techniques, and case studies. ● To understand institutional mechanisms and stakeholder roles in disaster preparedness, response, mitigation, and recovery.			
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>			
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>			
Units	Syllabus		
Unit 1	Introduction to Disaster Management Disaster – definition, concepts, factors and significance; disaster cycle and phases of disaster; culture of safety, prevention, mitigation and preparedness; community-based DRR; impact of disasters and hazards.		
Unit 2	Natural Hazard Classification of disasters in detail; history of disasters and types of natural hazards including earthquakes, volcanism, cyclones, tsunamis, floods, droughts and famines, landslides, avalanches and GLOF; environmental impacts; hailstorms, heat waves, cold waves, frost and fog. Human-Induced Disaster Classification of man-made disasters; socio-technical and technological disasters; transportation accidents; structural collapse; nuclear and industrial accidents; oil slicks and spills; war and conflicts		
Unit 3	Disaster Management Applications and Case Studies Landslide hazard zonation; earthquake vulnerability assessment of buildings and infrastructure; drought assessment; coastal flooding and storm surge assessment; fluvial and pluvial floods; forest fire; man-made disasters; space-based inputs for disaster mitigation and management; field work related to disaster management; outbreaks of disease and epidemics.		
Unit 4	Approaches to Disaster Risk Reduction Approaches to DRR; roles and responsibilities of community, PRIs/ULBs, States and Centre; State Disaster Management Authority; early warning systems; advisories from appropriate agencies.		

Course Outcomes (COs)

At the end of the course students will be able to:

CO1: Explain the concepts, principles and phases of disaster management and their relevance to sustainable development.

CO2: Analyze the causes, characteristics and impacts of natural and human-induced disasters using disaster management frameworks.

CO3: Apply disaster risk reduction approaches, assessment techniques and institutional mechanisms for enhancing community resilience and disaster preparedness.

Suggested Readings:

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila.
3. Central Water Commission, 1987, Flood Atlas of India, CWC, New Delhi.
4. Central Water Commission, 1989, Manual of Flood Forecasting, New Delhi.
5. Government of India, 1997, Vulnerability Atlas of India, New Delhi.
6. Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

Name of the Course		Hazard Vulnerability and Risk Assessment	
Course Code: PCC-DRRM-102	Credits - 4, MM: 70	L-3, T-1, P-0	
		Internal Assessment: 30	
Course Objectives • To develop understanding of scientific research methods and research design principles. • To provide knowledge of data collection, analysis and interpretation techniques. • To enhance skills in technical writing, report preparation and research presentation. • To promote ethical research practices, academic integrity and awareness of intellectual property rights.			
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>			
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>			
Units	Syllabus		
Unit 1	Introduction to Risk Concepts Risk concepts, elements of risk, risk perception, acceptable risk and introduction to risk evaluation; fundamentals and methodologies for risk analysis, assessment, evaluation and management; definitions and overview of risks and dangers; assessment of risks for different disaster types, extreme events and environmental health risks; and selected case studies.		
	Risk Assessment and 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 participatory risk assessment.		
Unit 2	Hazard Vulnerability Observation and perception of vulnerability; vulnerability identification, types and dimensions; social and economic factors; vulnerability in shanty settlements and cities; risk in urban areas; issues in urban planning; initiatives for risk reduction in India.		
	Strategic Planning for Vulnerability Reduction Data models for collection of information; risk assessment applications for disaster mitigation and management problems; crisis-management training; population growth, infrastructure and vulnerability reduction; policy making; hazard-resistant design and construction; systematic management and strategic planning for vulnerability reduction.		
Unit 3	Policies and Approaches Prevention and response mechanisms; emergency management teams; national and international disaster recovery policies and programmes; institutional framework and policies.		

Course Outcomes (COs)

At the end of the course students will be able to:

CO1: Explain the concepts, principles and methodologies of hazard, vulnerability and risk assessment in disaster management.

CO2: Analyze disaster risks using qualitative and quantitative risk assessment techniques for different hazards and vulnerable communities.

CO3: Evaluate vulnerability factors and formulate strategic planning approaches for risk reduction and disaster resilience.

Suggested Readings:

1. White, Gilbert F. and J. Eugene Hass, 1975, Assessment of Research on Natural Hazards, Cambridge, the MIT Press, MA.
2. NOAA Coastal Services Center, "Linking People, Information and Technology, "Risk and Vulnerability Assessment Tool" at <http://www.csc.noaa.gov/rvat/criticalEdd.html>
3. www.nidmindia.nic.in
4. <http://www.cambridge.org>.

Name of the Course	Research Methodology and Ethics	
Course Code: RBC-RM-101	Credits-3, MM: 70	L-3, T-0, P-0
		Internal Assessment: 30
Course Objectives ● Develop understanding of research problem formulation, literature review and hypothesis development. ● Impart knowledge of research design, data collection, sampling, analysis and interpretation. ● Develop competence in scientific reporting, thesis writing, referencing and research presentation. ● Familiarize students with research ethics, plagiarism, IPR, copyright, patenting and academic integrity.		
For paper Setter: The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus. For Candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.		
Units	Syllabus	
Unit 1	Research Formulation Research and research problem; selecting and defining the problem; importance of literature review; primary and secondary sources; reviews, treatises, monographs, patents and web resources; critical literature review; identifying gap areas; development of working hypothesis.	
Unit 2	Research Design and Methods Basic principles and need of research design; features of good design; observation and facts; laws and theories; prediction and explanation; induction and deduction; development of models; plan of action and design. Data Collection and Analysis Execution of research; observation and collection of data; methods of data collection; sampling methods; data processing and analysis strategies; analysis with statistical packages; hypothesis testing; generalization and interpretation.	
Unit 3	Reporting and Thesis Writing Structure and components of scientific reports; technical reports and theses; steps in preparation; layout, structure and language; illustrations and tables; bibliography, references and footnotes; oral presentation; visual aids; research projects and funding agencies. Application of Results and Ethics Environmental impacts; ethical issues; ethical committees; commercialization; copyright and royalty; IPR and patent law; plagiarism; citation and acknowledgement; reproducibility and accountability.	

Course Outcomes (COs)

At the end of the course students will be able to:

CO1: Formulate research problems, conduct literature reviews and develop appropriate research designs for disaster-related studies.

CO2: Apply data collection, analysis and interpretation techniques using scientific and statistical methods.

CO3: Demonstrate scientific writing, reporting skills and adherence to research ethics, intellectual property rights and academic integrity.

Suggested Readings:

- Council of Biology Editors–CRE Style Manual, American Institute of Biological Sciences, Washington. D.C.
- Effective Writing for Engineers, Managers, Scientists: Tichy AJIO.
- How to write and publish a scientific paper: Day RA.
- Kothari C.R, (2004), Research Methodology- Methods and Technique (New Age International, New Delhi

Name of the Course	Emergency, Humanitarian and Incident Response System	
Course Code: PCC-DRRM-104	Credits-4, MM: 70	L-3, T-1, P-0
		Internal Assessment: 30
Course Objectives • To provide knowledge of emergency response systems, humanitarian assistance and incident response mechanisms. • To develop understanding of communication and risk communication strategies during disasters. • To examine the role of media, public affairs and information management in disaster response. • To strengthen skills in collaborative decision-making and community engagement for disaster resilience.		
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>		
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>		
Units	Syllabus	
Unit 1	Emergency Response Emergency response; standard operating procedures; information management systems; warning dissemination; evacuation; search and rescue; relief operations; emergency operation centre’s resource management and networking; India Disaster Resource Network; role of disaster response forces and community-based organizations; Incident Response System.	
Unit 2	Communication System Role, nature and scope of disaster communication; sender- and receiver-oriented views; models and processes of communication as applied to disaster management; communication traditions and their relevance; normative perspective on disaster communication. Communication Risk Risk communication models; theoretical basis; risk reduction communication cycle; disaster warnings; risk perception and hazard awareness; cultural influences and cultural cognition theory; approaches influencing hazard adjustment and adoption.	
Unit 3	Media and Public Affairs Role of media in disaster management and humanitarian crises; objectives of mass media; ethical issues; understanding news-media coverage of disaster; biases and stereotypes; reporting challenges; newsworthiness, phases of disaster reporting, sources of news and reporting checklists.	

Unit 4	Public Communication and Collaboration Resolution through collaboration and consensus; citizens' forums, public voices and public sphere; social-justice challenges; media advocacy for disaster management; building resilience for disaster risk; case studies and reporting assignments.
Course Outcomes (COs) At the end of the course students will be able to: CO1: Explain the principles, frameworks and operational procedures of emergency and humanitarian response systems. CO2: Apply communication, risk communication and information management strategies during disaster situations. CO3: Evaluate the role of media, public participation and collaborative approaches in disaster response and resilience building.	
Suggested Readings: 1. Alexander, D. (2015). Disaster and Emergency Planning for Preparedness, Response and Recovery. Oxford University Press, Oxford. 2. Haddow, G., Bullock, J., & Coppola, D. P. (2021). Introduction to Emergency Management (7th Ed.). Butterworth-Heinemann, Oxford. 3. Sphere Association (2018). The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response. Geneva. 4. National Disaster Management Authority (NDMA). Incident Response System Guidelines. Government of India, New Delhi.	

Name of the Course		Disaster Governance, Policy and Institutional Frameworks	
Course Code: PCC-DRRM-105	Credits-4, MM: 70	L-3, T-1, P-0	
		Internal Assessment: 30	
Course Objectives ● To introduce concepts, principles and institutional mechanisms of disaster governance. ● To provide understanding of international, national and state-level disaster management policies and frameworks. ● To examine community-based governance, inclusive policies and capacity-building approaches. ● To develop knowledge of emerging challenges and innovations in disaster governance and resilience planning.			
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>			
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>			
Units		Syllabus	
Unit 1		Foundations of Disaster Governance and Risk Management Concepts and principles of disaster governance; disaster management cycle; governance approaches and institutional structures; role of policy, planning and ethics in disaster governance; resilience-based and multi-hazard approaches; integration of disaster risk management with sustainable development and climate adaptation.	
Unit 2		International Frameworks, Policies and Legal Instruments Global disaster governance systems; international disaster laws and humanitarian principles; role of United Nations agencies and international organizations; Sendai Framework for Disaster Risk Reduction 2015–2030, Hyogo Framework for Action 2005–2015, Paris Agreement and Sustainable Development Goals; transboundary disaster cooperation; global best practices and policy implementation mechanisms.	
Unit 3		National and State-Level Disaster Management Systems National and state disaster management frameworks; disaster management emergency operation systems; policy integration with development planning; urban and regional disaster governance; disaster financing, insurance and risk transfer mechanisms; coordination among government agencies, local bodies and stakeholders; governance challenges in mountainous, urban and hazard-prone regions.	
Unit 4		Community-Based Governance, Capacity Building and Inclusive Policies Community-based disaster risk management (CBDRM); participatory governance and local institutional mechanisms; role of Panchayati Raj Institutions, NGOs and civil society; gender-sensitive and inclusive disaster policies; disaster education, training and awareness; communication strategies and social resilience; capacity building for preparedness, response and recovery post-disaster recovery and “Build Back Better” strategies; policy monitoring and evaluation.	

Course Outcomes (COs)

At the end of the course, students will be able to:

CO1: Explain the concepts, principles and institutional mechanisms of disaster governance at local, national and international levels.

CO2: Analyse disaster management policies, legal frameworks and governance approaches for risk reduction and resilience building.

CO3: Evaluate community-based, inclusive and innovative governance strategies for effective disaster preparedness, response and recovery.

Suggested Readings:

1. Coppola, D. P. (2020). *Introduction to International Disaster Management* (4th Edition), Butterworth-Heinemann (Elsevier), Oxford.
2. Kapoor, A., & Singh, A. K. (2019), *Disaster Management and Preparedness*, CBS Publishers & Distributors, New Delhi.
3. Alexander, D. (2015), *Disaster and Emergency Planning for Preparedness, Response and Recovery*. Oxford University Press, (Governance structures, planning and institutional arrangements).
4. United Nations Office for Disaster Risk Reduction (2015).
Sendai Framework for Disaster Risk Reduction 2015–2030.
5. National Disaster Management Authority, *National Disaster Management Guidelines* (Various Volumes), Government of India, New Delhi.
6. National Institute of Disaster Management, *Training Modules and Manuals on Disaster Governance and Risk Reduction*,
7. Government of India, *Disaster Management Act*, 2005.

Name of the Course	Disaster Preparedness and Life-Saving Skills	
Course Code: PCC-DRRM-106	Credits: 2 (4 hours/week)	L-0, T-0, P-4
		End Semester Examination Max. Marks: 50 Min. Pass Marks: 20
Internal Assessment: (Quizzes, Assignments, Multiple choice questions test, field work report, project, presentation, community activity, simulation)		Internal Assessment: Max. Marks: 50 Min. Pass Marks: 20
Course Objectives • Develop basic first-aid and life-saving skills. • Promote disaster preparedness and safety. • Develop search, rescue, and fire-safety skills. • Learn appropriate responses to different disasters. • Develop basic psychological first-aid and health-safety skills. • Promote safe practices for reducing disaster risks.		
Field Demonstration		
Life-Saving Skills ❖ First Aid in disasters: Golden hour concept, CPR, wounds, choking, burns, fractures, animal bites (snake/dog/rabid), heat-related illnesses, triaging, stampede. ❖ Household and personal preparedness and protection: 72-hour emergency kit, safe food storage, water purification, ORS use, water sanitation and hygiene (WASH) and Infection Prevention Control (IPC) practices, Basic Sign Language. ❖ Search and rescue methods. ❖ Fire safety and electrical/gas/LPG safety: Causes, prevention, fire extinguisher demonstration, indigenous methods (Natural first-aid remedies- aloe vera, turmeric, coconut oil, salt solution); traditional risk-reduction practices. ❖ Disaster-specific response: Floods, landslides, earthquakes, CBRN emergencies, pandemics, drowning, lightning, gas leakage, cyclone, heatwave, coldwave. ❖ Psychosocial support in DRR; Steps for implementing psychological first aid and its importance. ❖ Public health preparedness: Public health impacts of various disasters, Prevention of post-disaster water-borne and vector-borne diseases.		
The training will be conducted by experienced professionals from NDRF, SDRF, Indian Armed Forces, firefighting, medical, sports, and other relevant sectors, providing practical, skill-based training.		

Training Modules and Guidelines

1. Do's and Don'ts for Common Disasters: https://nidm.gov.in/PDF/IEC/DOS_E_24.pdf
Simple safety instructions for major disasters.
2. Community-based disaster risk management:
https://nidm.gov.in/PDF/Modules/ToTModule_CBDRM2025.pdf
3. Management of crowds at large congregations:
https://nidm.gov.in/PDF/Modules/TrgMod_CrowdatLargeCongregations.pdf
4. Climate change and extreme events risk reduction:
https://nidm.gov.in/PDF/Modules/TM_CCEERR_23.pdf
5. Health adaptation and resilience to climate risks;
https://nidm.gov.in/PDF/Modules/NIDM_HARCR2021.pdf
6. NIDM IEC Material: <https://nidm.gov.in/iec.asp>
Informational and awareness-raising content on DRR.
7. Social and Behavioral Change Communication (SBCC) Training Module:
https://nidm.gov.in/sbc_training_module.asp
Training content for behavior change during disasters.
8. SBC Toolkit – Cyclone: https://nidm.gov.in/sbc_cyclone.asp
Preparedness and response strategies for cyclone-prone areas.
9. SBC Toolkit – Flood: https://nidm.gov.in/sbc_floods.asp
Community-level flood preparedness material.
10. SBC Toolkit – Earthquake: https://nidm.gov.in/sbc_eq.asp
Guidelines for earthquake risk reduction.
11. NIDRR Checklist and Planning Tools:
<https://nidm.gov.in/pdf/sbc/DRR%20Checklist%20PDF%20for%20WEB.pdf>
Tools for local disaster preparedness planning.
12. NIDRR Communication Materials User Guide:
<https://nidm.gov.in/pdf/sbc/NIDM%20User%20Guide%20Communication%20Material%20PDF%20for%20WEB.pdf>
Reference for community-level communication campaigns.
13. NIDM Training Modules: <https://nidm.gov.in/modules.asp>
Topic-wise training modules for educators and practitioners.

Name of the Course	Emerging Technologies, AI Applications and Field-Based Resilience Planning	
Course Code: PCC-DRRM-201	Credits-4, MM: 70	L-3, T-1, P-0
		Internal Assessment: 30
Course Objectives • To provide an overview of emerging technologies and their applications in disaster risk reduction and resilience. • To introduce Artificial Intelligence, Machine Learning and geospatial technologies for disaster management. • To develop skills in hazard mapping, field assessment and community resilience planning. • To promote integration of technological innovations and participatory approaches for disaster resilience.		
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>		
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>		
Units	Syllabus	
Unit 1	Emerging Technologies in Disaster Risk Resilience Role of science and technology in disaster management, Overview of emerging technologies in DRR, Introduction to GIS, remote sensing and digital mapping, Smart infrastructure, resilient technologies and early warning technologies, Smart and resilient communities	
Unit 2	Fundamentals of Artificial Intelligence and Data Applications Introduction to Artificial Intelligence (AI) and Machine Learning (ML), Basics of data collection and disaster databases, AI applications in flood, landslide and earthquake prediction, Image and satellite data interpretation, Introduction to big data and cloud computing, Ethical issues and limitations of AI in disaster management	
Unit 3	Geospatial Technologies and Hazard Mapping Basics of GIS and remote sensing, Satellite imagery and terrain analysis, Hazard zonation and vulnerability mapping, GPS and mobile-based field data collection, Introduction to drone/UAV applications, Spatial data visualization and map preparation, Applications of geospatial technologies in DRR	
Unit 4	Field-Based Resilience Planning and Community Participation Community-based disaster risk reduction (CBDRR), Field survey and rapid assessment techniques, Participatory rural appraisal (PRA) methods, Infrastructure and livelihood vulnerability assessment, Preparation of community resilience plans. Integrated Applications and Resilience Planning Integration of AI, GIS and field observations, Early warning and decision-support systems, Smart disaster management systems, Future trends in disaster technologies and resilience planning	

Course Outcomes (COs)

At the end of the course students will be able to:

CO1: Describe the role of emerging technologies, AI and geospatial tools in disaster risk reduction and resilience planning.

CO2: Apply AI, GIS, remote sensing and field-based assessment techniques for hazard analysis and community resilience planning.

CO3: Integrate technological and participatory approaches to develop sustainable disaster resilience and decision-support strategies.

Suggested Readings:

1. Disaster Management: Future Challenges and Opportunities, Jagbir Singh, G.S. Dhaliwal, I.K. International Publishing House, New Delhi
2. Remote Sensing and Image Interpretation, Thomas Lillesand, Ralph Kiefer, Jonathan Chipman, Wiley
3. Digital Earth and Smart Disaster Management, Huadong Guo et al., Springer

Name of the Course	Geoinformatics in Disaster Management	
Course Code: PCC-DRRM-202	Credits-4, MM: 70	L-3, T-1, P-0
		Internal Assessment: 30
Course Objectives • To introduce the principles and applications of remote sensing, GIS and GNSS in disaster management. • To develop understanding of geospatial data acquisition, processing and analysis techniques.		
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>		
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>		
Units	Syllabus	
Unit 1	Basics of Remote Sensing History, development, definition, concept and principles of remote sensing; electromagnetic radiation and its characteristics; wavelength regions and significance; interaction of EMR with atmosphere and earth’s surface; atmospheric windows; spectral, spatial, temporal and radiometric resolutions; concept of satellite, sensor and orbit; image interpretation and digital image processing.	
Unit 2	Data Acquisition Platforms such as balloon, rocket, helicopter, aircraft and spacecraft; aerial versus satellite remote sensing; satellites and their specifications; sensors and their characteristics; open data sources.	
Unit 3	Basic Concepts of GIS Definition, philosophy and evolution of GIS; spatial versus non-spatial data; raster and vector data models; data structures and file formats; topology; DBMS in GIS; data input and projections; geometric transformation of raster and vector data.	
Unit 4	Satellite Positioning System – An Overview Introduction to GNSS; global and regional satellite constellations; GPS signals and basic concepts; pseudo range and phase difference measurement; sources of GNSS errors; datum/ellipsoid; global versus Indian geodetic datum; coordinate systems; transformation of coordinates; GNSS remote sensing.	

Course Outcomes (COs)

At the end of the course students will be able to:

CO1: Explain the principles of remote sensing, GIS and GNSS technologies used in disaster management.

CO2: Apply geospatial data acquisition, processing and analysis techniques for hazard, risk and vulnerability assessment.

CO3: Develop GIS- and remote sensing-based solutions for disaster risk reduction, planning and sustainable development.

Suggested Readings:

1. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). Principles of Geographical Information Systems. Oxford University Press.
2. Chang, K. T. (2019). Introduction to Geographic Information Systems (9th Ed.). McGraw-Hill Education.
3. Lillesand, T., Kiefer, R., & Chipman, J. (2015). Remote Sensing and Image Interpretation (7th Ed.). Wiley.
4. Longley, P., Goodchild, M., Maguire, D., & Rhind, D. (2015). Geographic Information Science and Systems (4th Ed.). Wiley.

Name of the Course	Financial Resilience and Risk Transfer	
Course Code: PCC-DRRM-203	Credits-4, MM: 70	L-4, T-0, P-0
		Internal Assessment: 30
Course Objectives ● To provide understanding of quality management systems and strategic approaches in disaster management. ● To develop knowledge of financial planning and resource management for disaster preparedness and recovery. ● To examine financial vulnerabilities and mechanisms for enhancing community and institutional resilience. ● To introduce disaster risk financing, insurance and risk transfer instruments for sustainable disaster management.		
For paper Setter: <i>The question paper will consist of five Sections A, B, C, D & E of 14 marks each. Section E will be compulsory, it will consist of subparts of short answer type, which will cover the entire syllabus. Section A, B, C & D will have two questions from the respective sections of the syllabus.</i>		
For Candidates: <i>Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. A non- programmable calculator is allowed to use in examinations.</i>		
Units	Syllabus	
Unit 1	Quality Management Systems Quality assurance – definition, principles and components; quality monitoring cycle; quality assurance projects; PDCA model; quality control; benchmarking; best practices; auditing; risk management; modular Kaizen method; ISO standards; case studies.	
Unit 2	Strategic Disaster Management Strategy, definitions, concepts and frameworks; SWOT, experience curve, portfolio theory, strategic thinking and decision-making; scenario analysis; implementation, evaluation and sustainability; financing a new venture; identifying strategies to reduce the gap between financial vulnerability and capacity.	
Unit 3	Financial Planning for Natural Disasters Identifying disasters with potential financial implications in the community; measuring local government financial vulnerability to natural disasters; measuring financial capacity to address disasters; identifying regional financial vulnerabilities.	
Unit 4	Disaster Financial Management Disaster financial management team composition; cash-flow management; debt monitoring; risk avoidance; disaster assessment and expense reimbursement; project and portfolio management; financial analysis; maintaining records for audits; supply-chain management; procurement and contracting practices.	

	Financial Instruments and Risk Transfer Financial arrangements for disaster losses, climate-related loss financing, institutional mechanisms for loss sharing and practical approaches to disaster risk transfer and resilience financing.
Course Outcomes (COs) At the end of the course students will be able to: CO1: Explain quality management systems, strategic planning concepts and financial resilience frameworks in disaster management. CO2: Analyze financial vulnerabilities, disaster-related risks and resource management strategies for effective disaster preparedness and recovery. CO3: Evaluate financial instruments, risk transfer mechanisms and resilience financing approaches for sustainable disaster risk management.	
Suggested Readings: 1. Mechler, R. (2004). Natural Disaster Risk Management and Financing Disaster Losses in Developing Countries. Verlag für Versicherungswirtschaft, Karlsruhe. 2. World Bank (2014). Financial Protection against Natural Disasters: From Products to Comprehensive Strategies. World Bank Publications, Washington D.C. 3. Benson, C. & Clay, E. (2004). Understanding the Economic and Financial Impacts of Natural Disasters. World Bank, Washington D.C. 4. OECD (2023). Building Financial Resilience to Climate and Disaster Risks. OECD Publishing, Paris.	

Name of the Course	Geospatial Techniques for Emergency Management	
Course Code: PCC-DRRM- 204	Credits -2 , (4hours/week)	L-0, T-0, P-4
		End Semester Examination Max. Marks: 50 Min. Pass Marks: 20
Internal Assessment: (Quizzes, Assignments, Multiple choice questions test, field work report, project, presentation, community activity, simulation)		Internal Assessment: Max. Marks: 50 Min. Pass Marks: 20
Course Objectives • To provide practical knowledge of hazard, vulnerability and risk assessment using geoinformatics tools. • To enhance the use of geospatial technologies for disaster risk reduction and sustainable development planning. • To develop practical skills in preparedness, evacuation, search and rescue, and disaster response.		
GIS and RS in DRR (Practical) GIS & Remote Sensing Basics: Vector/raster data, CRS, scale and resolution. Spatial Data Management: Data acquisition, digitization, georeferencing, editing and topology. Spatial Analysis & Mapping: Overlay, buffering, terrain analysis and thematic mapping. Hazard & Risk Mapping: Hazard zonation, risk and vulnerability assessment. Damage Assessment: Image interpretation, change detection and post-disaster assessment. Land-Use Planning: LULC mapping, change detection and suitability analysis. DRR Applications: GIS/RS applications in flood, landslide, environmental, hydrological and health risk management. Case Studies: Practical applications using real-world disaster datasets. Software Tools: QGIS ArcGIS Google Earth Engine SNAP SAGA GIS/GRASS GIS		
Books/References: • Joseph, G. (2003), Fundamentals of Remote Sensing, Orient Longman Press, Bangalore. • Lillesand, T.S. and R. W. Kiefer, (2002), Remote Sensing and Image Interpretation, Fourth Edition, John Wiley and Sons, New York. • Tomaszewski, B. <i>Geographic Information Systems (GIS) for Disaster Management</i>, 2nd ed., Routledge. — Highly recommended for the DRR component, including disaster mapping and GIS-based analysis. The companion site also provides exercises and datasets.		

- Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. *Geographic Information Science and Systems*, Wiley. — Recommended for GIS fundamentals, spatial data, analysis and spatial relationships.
- Campbell, J. B. & Wynne, R. H. *Introduction to Remote Sensing*, Guilford Press. — Useful for satellite data and image-analysis fundamentals.

Software Manuals / Practical Manuals

- QGIS Training Manual – Official QGIS documentation. It covers vector and raster data, topology, vector analysis, raster analysis, map preparation and practical exercises.
- QGIS User Guide / Desktop User Guide – Official QGIS documentation for practical software operations and GIS analysis.
- QGIS and InaSAFE for Disaster Management – Training Manual – Particularly relevant to this course because it covers GIS for disaster management, QGIS, vector/raster data, map preparation and InaSAFE-based disaster analysis.
- A Gentle Introduction to GIS – QGIS documentation; useful for students beginning GIS and spatial analysis.
- Learn QGIS – 5th Edition, Eugenia Sarafova, Ivan Ivanov, Andrew Cutts & Anita Graser. — A current hands-on reference for QGIS and GIS analysis; the QGIS project lists the 5th edition as a 2026 publication.

Name of the Course	Internship	
Course Code: PCC-DRRM-205	Credits-5	External Assessment: 100 Internal Assessment: 50
Course Objectives • To provide practical field-level exposure and work experience. • To encourage innovation, applied research, and documentation in Disaster Risk Reduction (DRR). • Enable students to apply theoretical knowledge and technical skills acquired during the PG Diploma programme to actual disaster-management problems. • Familiarize students with disaster-management institutions and systems, including government agencies, local authorities, NGOs, emergency services and other relevant organizations. • Develop the ability to prepare technical reports and recommendations based on field observations, data analysis and practical experience.		
Internship Requirement • Each student shall undertake an internship of at least eight weeks in an institution, industry, educational institution, business organization, government or non-government organization, research institution, emergency service, or any other recognized organization working directly or indirectly in the field of Disaster Risk Reduction and Management. • The internship shall provide students with exposure to practical disaster-risk reduction activities, including, wherever applicable, hazard and risk assessment, disaster preparedness and planning, mitigation measures, emergency response, recovery and rehabilitation, community-based DRR, GIS and remote sensing, early-warning systems, climate-risk assessment, disaster data management, infrastructure resilience and related activities. • The internship shall be undertaken under the joint supervision of a faculty mentor from the University and a designated supervisor/mentor from the host organization. The internship programme and host organization shall be approved by the Department/Centre before commencement.		
Submission Requirements At the completion of the internship, each student shall submit: 1. Internship/Experience Certificate issued by the host organization. 2. Detailed Internship Report/Dissertation describing the organization, objectives, methodology/work undertaken, observations, analysis, outcomes, learning and recommendations. 3. Detailed Presentation before the Department/Centre. 4. Viva-Voce based on the internship work and submitted report.		
Assessment The internship shall carry 150 marks: 50 marks for internal assessment based on performance at the host organization, internship diary/logbook and continuous supervision; and 100 marks for end-semester evaluation based on the technical report/dissertation, presentation and viva-voce. Note: Candidates may pursue the mandatory 5-credit industrial training/internship during the scheduled winter vacation of the academic session.		