

COMPLETION REPORT

CERTIFICATE COURSE

Artificial Intelligence/Machine Learning (AI/ML) and Data Analytics: Theory into Practice in Disaster Management

Organized by: Department of Geography, Loreto College, Kolkata

Collaborators: Keio University (Japan), IIT Roorkee (India), RIKI Institute

Duration: 42 hours (Hybrid Mode)

Duration: September 27, 2024 – January 27, 2025

Introduction

The increasing frequency and intensity of natural disasters worldwide have amplified the urgency of integrating advanced technologies into disaster risk reduction and management strategies. Recognizing this, Loreto College, Kolkata, launched a 42-hour hybrid certificate

course titled “Artificial Intelligence/Machine Learning and Data Analytics: Theory into Practice in Disaster Management” in collaboration with Keio University, Japan, IIT Roorkee, and RIKI Institute.

In her inaugural address, Dr. Sushma Sahai, Head of the Department of

Geography, emphasized that

disaster management must be central to sustainable development policies of disaster-prone countries. She highlighted its relevance to the Sustainable Development Goals (SDGs) and UNESCO’s commitment to improving education and public awareness.

The poster is for a Hybrid Certificate Course titled "Artificial Intelligence/Machine Learning (AI/ML) and Data Analytics: Theory into Practice in Disaster Management". It is organized by Loreto College, Kolkata, in collaboration with Keio University, Japan, IIT Roorkee, India, and RIKI Institute, India. The course starts on September 27, 2024, and has a fee of INR 35,000. The poster includes a list of course objectives, details, and an outline.

Course Objectives

1. To gain a theoretical understanding of Disaster management, Artificial intelligence, Machine learning, and their real-world applications
2. Hands-on experience in open street mapping and basic coding
3. Hands-on application of learned lessons in developing solution

Course details

Duration: 2hrs per day for 5 weeks
Lecture classes: 28 hours
Practical sessions: 14 hours
Project evaluation: 2 capstone projects to be evaluated in the last week

Course Outline

Sl. No.	Topic	Week	Hours	Mode
1	Basics of Disaster Management and related AI/ML	Week 1	4	Online
2	Basics on AI/ML and Data Analytics	Week 2	4	Online
3	Introduction of GIS and Remote Sensing	Week 3	4	Online
4	Application of AI/ML and Data Analytics for Disaster Management	Week 4	4	Online
5	Data in the Disaster Situation	Week 5	4	Online
6	Disaster Preparedness	Week 6	4	Online
7	Disaster Response	Week 7	4	Online
8	Disaster Recovery	Week 8	4	Online
9	Disaster Prevention	Week 9	4	Online
10	Disaster Mitigation	Week 10	4	Online
11	Disaster Preparedness	Week 11	4	Online
12	Disaster Response	Week 12	4	Online
13	Disaster Recovery	Week 13	4	Online
14	Disaster Prevention	Week 14	4	Online
15	Disaster Mitigation	Week 15	4	Online
16	Disaster Preparedness	Week 16	4	Online
17	Disaster Response	Week 17	4	Online
18	Disaster Recovery	Week 18	4	Online
19	Disaster Prevention	Week 19	4	Online
20	Disaster Mitigation	Week 20	4	Online
21	Disaster Preparedness	Week 21	4	Online
22	Disaster Response	Week 22	4	Online
23	Disaster Recovery	Week 23	4	Online
24	Disaster Prevention	Week 24	4	Online
25	Disaster Mitigation	Week 25	4	Online
26	Disaster Preparedness	Week 26	4	Online
27	Disaster Response	Week 27	4	Online
28	Disaster Recovery	Week 28	4	Online
29	Disaster Prevention	Week 29	4	Online
30	Disaster Mitigation	Week 30	4	Online
31	Disaster Preparedness	Week 31	4	Online
32	Disaster Response	Week 32	4	Online
33	Disaster Recovery	Week 33	4	Online
34	Disaster Prevention	Week 34	4	Online
35	Disaster Mitigation	Week 35	4	Online
36	Disaster Preparedness	Week 36	4	Online
37	Disaster Response	Week 37	4	Online
38	Disaster Recovery	Week 38	4	Online
39	Disaster Prevention	Week 39	4	Online
40	Disaster Mitigation	Week 40	4	Online
41	Disaster Preparedness	Week 41	4	Online
42	Disaster Response	Week 42	4	Online

For any query please drop an email at sahai.gau@loretocollege.in

Course Objectives

1. To gain theoretical understanding of disaster management, AI, ML, and their real-world applications.
2. To provide hands-on experience in GIS tools (Open- source mapping software QGIS), Python, R and basic coding.
3. To apply acquired knowledge and skills in developing innovative disaster management solutions.

Learning Outcomes

At the end of the course, participants:

- Acquired the ability to apply AI and data analytics to disaster management and climate change contexts.
- Gained theoretical knowledge and practical exposure in QGIS tools, Python, R and basic coding, enhancing their industry readiness.
- Developed competence in using cutting-edge technologies for effective disaster risk management.

Key Resource Persons

- Prof. Rajib Shaw, Graduate School of Media and Governance, Keio University, Japan; Co-chair, Asia Science Technology Academic Advisory Group; Coordinating Lead Author, IPCC 6th Assessment Report – highlighted the critical role of technology in disaster management.
- Dr. Ranit Chatterjee, Co-founder, RIKA Institute, and Visiting Associate Professor, Keio University – discussed disaster risk reduction and climate change adaptation.
- Prof. Sudip Roy, Department of Computer Science and Engineering, IIT Roorkee – emphasized computer-aided design, IoT applications, and AI/ML techniques.
- Mr. Saikat Patra, Birla Institute of Technology, Mesra, Ranchi
- Dr. Kartick Chandra Mondal, Jadavpur University, Kolkata
- Ms. Krishnakali Ghosh, Program Manager, RIKA – presented the role of GIS in disaster management.

Participation

The course attracted 83 participants from diverse academic backgrounds, from Loreto College as well as from partner institutions in Kolkata and other cities through existing

Memoranda of Understanding. The hybrid format ensured accessibility to both local and outstation students.

Conclusion

The certificate course successfully combined theory with practical application, fostering interdisciplinary learning and equipping participants with the skills to leverage AI, ML, and data analytics in disaster management. The collaboration with international and national experts enriched the program and strengthened Loreto College's commitment to research, innovation, and capacity building in line with global best practices.