MAJOR-XIII

DM-MHV-355 Multi-Hazard Vulnerabilities Cr. H. 3

Course Description

Upon successful completion of the course, the student will be able to:

- **Understand** Physical, Economic, Social and Environmental Vulnerabilities in context of different hazards
- **Analyse** the dynamics of Geo-spatial and Multi-hazards Vulnerabilities.
- **Quantify** the multi-components of vulnerability

COURSE OUTLINE

1. **Introduction to Multi-Hazards Vulnerabilities**
   - Hazards: Types, Intensity, Density and Frequency
   - Vulnerability: Types, Root and Underlying Causes
   - Elements at risk
2. **Geo-Spatial Characteristics**
   - Characteristics of Hazards
   - Characteristics of Vulnerability
   - Exposure
   - Dynamics of Vulnerability
   - Interrelationship of element at risk, hazards, exposure and vulnerability
3. **Multi-component of Vulnerability**
   - Compound and Complex interrelationship
   - Quantification of vulnerability
   - Presentation of Vulnerability

Teaching Methodology

- Lectures
- Written Assignments
- Seminar
- lab work

Assessment Criteria:

1st Term (25%) Assignments/Quizzes and Presentations
Mid Term (35%) Written (Long Questions, Short Questions, MCQs)
Final Term (40%) Written (Long Questions, Short Questions, MCQs)

- Written (Long Questions, Short Questions, MCQs)

Textbooks:

1. Pal, I., Shaw, R. (2023). *Multi-Hazard Vulnerability and Resilience Building: Cross Cutting Issues.* Netherlands: Elsevier Science.
2. Ferreira, T. M. (2023). *Multi-risk Interactions Towards Resilient and Sustainable Cities.* Germany: Springer Nature Singapore.
3. Smith, K., Fearnley, C. J., Dixon, D., Bird, D. K., Kelman, I. (2023). *Environmental Hazards: Assessing Risk and Reducing Disaster*. United Kingdom: Taylor & Francis.

4. Das,J., Bhattacharya, S. K. (2022). *Monitoring and Managing Multi-hazards: A Multidisciplinary Approach*. Germany: Springer International Publishing.
5. Hilhorst,D., Bankoff, G. (2022). *Why Vulnerability Still Matters: The Politics of Disaster Risk Creation.* United Kingdom: Taylor & Francis.
6. Gao, J. (2023). *Remote Sensing of Natural Hazards.* CRC Press