

GIS and RS in Climate Change and Disaster Management (Elective)

Code DM-818	Credit Hours 3 – 0
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Course Description:

Aims to give students understanding of the latest technology of Remote Sensing and GIS and its application in effectively mapping hazards and risks associated with climate change in the view of disaster risk management.

Course Content:

Topics	Learning Outcomes
Introduction	Natural Hazards and Disasters in the World, Seismic Hazard, Volcanic Hazard, Floods and Tsunami, Windstorms, Forest Fires, Landslides and avalanches, Application of GIS and RS to natural Disasters
Principle of Remote Sensing	Introduction, EMR and Spectral reflectance (Optical Sensors, Synthetic Aperture Radar (SAR), Meteorological Satellites, High Resolution Satellites, LIDAR), Image Processing and Analysis, Change Detection
Principles of Geographic Information System	Introduction, Geo-spatial and Thematic Data and analysis (Topographic Maps, Remote Sensing data, GPS and Field Surveying data, Geological Data, Hydrological Data, Land use and Environmental Data, Social and Economic Data), Data Acquisition, Data Integration and Database Generation, Data Management and Updating, Spatial Analysis and Visualization, Geo-spatial Information Sharing and Services
Field visit to get information about disaster risk mapping	
Remote Sensing and GIS for climate hazard mapping and	Hazards and critical facilities mapping, Damage Assessment Methodologies, Early Damage Assessment, Case studies

assessment	
Disaster Risk Management	Introduction, Risk Management Approach, Integrated Risk Management for Natural Disasters, Case studies
Term-Project on GIS mapping	

Textbooks:

No textbook for this course. The course will be based on different reference books, reports, and conference and journal publications.

Reference Material:

1. P.A. Burrough (1986), Principle of Geographical Information Systems for Land Resources Assessment, Oxford Science Publications
2. P.A. Longley and et.al. (1999), Geographical Information Systems (Vol. I/II), Johan Wiley & Sons, Inc
3. S. Morain and S. L. Baaors (1996), Raster Imagery in Geographical Information System, ONWORD Press, 1996.
4. S. Murai (1996), Remote Sensing Note, Japan Association on Remote Sensing, 1996.
5. S. Murai (1998), GIS Working Book, Japan Association of Surveying, 1998.
6. Munich Re Group, Initiative towards Earthquake Safe Cities, Risk Assessment Tool for Diagnosis of Urban Areas against Seismic Disasters, CD-ROM
7. Campbell, J. B. (2011) Introduction to Remote Sensing, 5th edition, The Guilford Press, New York, USA, ISBN: 9781609181765
8. Lillesand, T. M. & Kiefer, R. W. (2007) Remote Sensing and Image Interpretation, 6th ed., John Wiley & Sons Inc, ISBN: 9780470052457

Pre-requisite:

Preferably students with engineering background

Assessment System

Quizzes	15%
Assignments	10%
Mid-Semester Exam	25%
Term Project/Paper	10%
End Semester Exam	40%