



Risk, Vulnerability and Resilience: Concepts and Understanding

Semester -I: July – December (Proposed)

Coordinator	Prof P K Joshi
Credits	4 Credits
Lecturers	Prof P K Joshi
Level	M.A.
Host institution	Special Centre for Disaster Research (SCDR), Jawaharlal Nehru University, New Delhi
Course duration	One Semester [July - December] Likely to start in July 2019

Summary

This one full semester core course provides the Master level students of Disaster Studies the basic understanding of vulnerability and its assessment methods. This course focuses on the wide range of vulnerability and risk assessment processes and methods. This course is about procedures to collect, analyze and evaluate geospatial data for risk assessment from natural and man-made hazards. The course includes individual assignments.

Target Student Audiences

Semester - I Students of M.A.

Prerequisites

- Nil

Aims and Objectives

This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on vulnerability assessment. The main objectives of the course are: (i) To help students understand the concepts of vulnerability and vulnerability assessment methods, critically analyze them, (ii) To understand the basics to develop framework and recommendation for vulnerability assessment techniques, (iii) To help students guide through entire process of risk assessment using geospatial domain, and (iv) To understand and formulate requirements of hazard data and methods.

General Learning Outcomes:

By the end of the course, successful students will:

- Understand the fundamental concept and science of vulnerability
- Learn the developments in approaches of vulnerability assessment
- Profound view about vulnerability of different systems
- Discriminate and interpret culture, social capital, socioeconomic vulnerabilities,
- Understand importance of geospatial approaches for vulnerability assessment





Overview of Sessions and Teaching Methods

The course will make most of interactive and self-reflective methods of teaching and learning including mainly lectures and presentations. It will start with an overview of vulnerability concepts and related terms. Subsequently it will build the science and practice of assessment methods and integration of geospatial approaches. The sessions will be take help of blended teaching and learning approaches for interaction lecturing on different course components.

Course Workload

The table below summarizes course workload distribution:

Activities	Learning outcomes	Assessment	Estimated workload (hours)
In-class activities			
Lectures and Presentations	Introduction to the concepts of Vulnerability. Key Terms and Definitions – Hazard, Vulnerability, Exposure, Coping Capacity and Resilience, Risk and related terms	Mid Semester Examination	04
Lectures and Presentations	Vulnerabilities of different systems (social and ecological), tipping points in the Earth System, issues for developing countries.	Mid Semester Examination	04
Lectures and Presentations	Basics of vulnerability and risk assessment (concept of exposure, sensitivity, and adaptive capacity), methods for analysis, decision analysis, management of uncertainty, and analysis of inherent and chronic vulnerabilities as well as those related to extreme events and hazards.	Mid Semester Examination	08
Lectures and Presentations	Development of framework for vulnerability assessment. Integration of social and natural science perspective and approaches to identify the purpose and focus of the vulnerability assessment (with the examples from different sectors). Qualitative to semi-quantitative methods to assess vulnerabilities to climate change.	Mid Semester Examination	08
Lectures and Presentations	Introducing disaster risk assessment and management, and rebuilding on importance of geospatial data. Elements at risk, classification, infrastructure, critical facilities, demography and collection of related information. Sources and methods of obtaining spatial	End Semester Examination	08





	data for risk assessment and presentation for various types of hazards. Hazard profiling, multiple hazard mapping, and maximum usage of Internet search and acquiring open and free (low cost) data. Participatory GIS, spatial multi-criteria evaluation and decision-making – to include component of vulnerability assessment (social, physical, ecological and other).		
Lectures and Presentations	Models for risk assessment and loss estimation. Qualitative and Quantitative risk assessment (including flood, seismic, landslide and technical risk assessment). Risk evaluation, cost benefit analysis and necessities for emergency planning and environmental impact assessment.	End Semester Examination	06
Lectures and Presentations	Spatial and holistic assessment of vulnerability (social, economic, environmental) to Natural Hazards (Case Studies) - Seismic Risk (Earthquakes and landslides) Floods, Heat waves, Drought, Forest fires, Coastal erosion	End Semester Examination	06
Independent work			
Individual Assignments	Ability to interpret data, and to use the concepts, tools, and methods for communicating information	Individual Presentations	12
Total			56

Grading

The students' performance will be based on the following:

- Quizzes/Surprise Test – 20%
- Mid Semester Examination – 30%
- End Semester Examination – 30%
- Individual Assignments – 20%

Course Schedule: Semester -I: July – December (Proposed)

Course Assignments

The Structure of Individual Assignments will be as follows:

- Book review on the given topic.
- Review of research articles and working paper with given objectives.

Literature

- Bankoff, G, Frerks G, and Hilhorst D, (2004). Mapping Vulnerability: Disasters, Development and People. eds. Pp. 115-127. London: Earthscan.





- Blaikie, P., Cannon, T., Davis, I. & Wisner, B. (1994). *At risk: natural hazards, people's vulnerability, and disasters*. New York: Routledge.
- Brooks, N. (2003). *Vulnerability, risk and adaptation: A conceptual framework*. Tyndall Centre for Climate Change Research Working Paper, 38, 1-16.
- Cannon, T., Twigg, J., & Rowell, J. (2003). *Social vulnerability, sustainable livelihoods and disasters*. London: DFID.
- Caribbean Handbook on Risk Management, ACP-EU Natural Disaster Risk Reduction Program (accessed from <http://www.charim.net/>)
- Daniel, M. B. III., & Cothorn, R. C. (2001). *Introduction to risk analysis: a systematic approach to science-based decision making*. Rockville: Government Institutes.
- Fang, W.H., et al. (2011). *Integrated Risk Governance: data base, risk map and network platform*. Beijing: Science Press.
- International Strategy for Disaster Reduction. (2007). *Building Disaster Resilient Communities: Good Practices and Lessons Learned – A Publication of the “Global Network of NGOs” for Disaster Risk Reduction*. http://www.unisdr.org/files/596_10307.pdf
- Leary, N., et al. (2008). *Climate change and vulnerability*. Earthscan in the UK and USA.
- Marzocchi, W., et al. (2009). *Principles of multi-risk assessment. Interaction amongst natural and man-induced risks*. Brussels: European Communities.
- Southwick, S. M. (2012). *Resilience: The Science of Mastering Life's Greatest Challenges*. New York: Cambridge University Press.
- van Westen CJ, Alkema D, Damen MCJ, Kerle N, and Kingma NA (2011). *Multi-hazard risk assessment*. United Nations University – ITC School on Disaster Geoinformation Management (UNU-ITC DGIM).
- Zakour, M.J. and Gillespie, D.F. (2013). *Community Disaster Vulnerability – Theory, Research and Practice*. Springer New York Heidelberg Dordrecht London