SHIV NADAR UNIVERSITY

GRADUATE COURSE DESCRIPTION

I. **COURSE TITLE:** Natural Hazards and Disasters

II. **COURSE CODE :** CED641

III. **COURSE CREDITS (L:T:P):** 4 (3 L: 1T: 0 P)

IV. **TOTAL CONTACT HOURS/ BATCH/WEEK (L:T:P): 3** (3 L: 1 T: 0 P)

V. **COURSE TYPE (Core/Elective):** Major Elective

VI. **PREREQUISITE/S (IF ANY):** None

VII. **SCHOOL/ DEPARTMENT:** Civil Engineering

VIII. **LEARNING OUTCOMES:**

- Students will be able to learn to demonstrate a critical understanding of the mechanisms of natural disasters and key concepts in disaster risk reduction and response.
- Students will be able to critically evaluate the mitigation measures, policies and practices from multiple perspectives.
- Students will understand specific types of disasters and conflict situations.
- Students will be able to assess the hazards and risks, critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries.
- Students will develop competencies in analyzing the relationship between development and disasters.

IX. **COURSE CONTENT:**

1. Natural hazards and disasters
2. Multiple hazards and the challenge of disasters
3. Internal structure of earth and plate tectonics
4. Earthquakes, tsunamis and volcanoes
5. Landslides and other downslope movements
6. Sinkholes, land subsidence, and swelling soils
7. Atmospheric processes and severe weather
8. Hurricanes and extratropical cyclones

9. Coastal hazards
10. Floods and droughts
11. Climate and climate change
12. Environmental and biological hazards
13. Risk and uncertainty assessment for multi-hazards
14. Disaster mitigation and recovery

X. **EVALUATION SCHEME:**

Quizzes (1 & 2) – 20%

Individual Project – 30%

Mid-term examination – 20 %

Final examination – 30%

A student has to score minimum 40% to pass the course.

XI. **RECOMMENDED READINGS:**

1. Donald Hyndman and David Hyndman, Natural Hazards and Disasters, Cengage Learning, 2016
2. John C. Pine, Hazards Analysis: Reducing the Impact of Disasters, CRC Press, 2015
3. Edward A. Keller and Duane E. DeVecchio, Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes, Routledge, 2016
4. Davia Cox Downey, Cities and Disasters, CRC Press, 2015
5. Rick Bissell, Steven Jensen and Shirley Feldman-Jensen, Preparedness and Response for Catastrophic Disasters, CRC Press, 2013
6. Larry R. Collins, Disaster Management and Preparedness, CRC Press, 2000
7. Deborah S.K. Thomas, Brenda D. Phillips, William E. Lovekamp and Alice Fothergill, Social Vulnerability to Disasters, 2nd Edition, CRC Press, 2013
8. David C. Alexander, Natural Disasters, CRC Press, 1993
9. Damon P. Coppola and Erin K. Maloney, Communicating Emergency Preparedness: Strategies for Creating a Disaster Resilient Public, CRC Press, 2009

10. Claire B. Rubin, Emergency Management: The American Experience 1900-2010, 2nd Edition, CRC Press, 2012
11. Thomas E. Drabek, The Human Side of Disaster, 2nd Edition, CRC Press, 2013
12. George Haddow, Jane A. Bullock and Kim Haddow, Global Warming, Natural Hazards, and Emergency Management, CRC Press, 2008
13. Jack Pinkowski, Disaster Management Handbook, CRC Press, 2008
14. Graham A. Tobin and Burrell E. Montz, Natural Hazards: Explanation and Integration, The Guilford Press, 1997
15. Piers Blaikie, Terry Cannon, Ian Davis and Ben Wisner, At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge, 2003
16. Karin Riley, Peter Webley and Matthew Thompson, Natural Hazard Uncertainty Assessment: Modeling and Decision Support, Wiley, 2016
17. Keith Smith, Environmental Hazards: Assessing Risk and Reducing Disaster, Routledge, 2009
18. A. Surjalal Sharma, Armin Bunde, Vijay P. Dimri and Daniel N. Baker, Extreme Events and Natural Hazards: The Complexity Perspective, AGU, Wiley, 2013
19. Natural Hazards Review, https://ascelibrary.org/journal/nhrefo
20. Natural Hazards and Earth System Sciences, https://www.natural-hazards-and-earth-system-sciences.net/
21. Natural Hazards, https://link.springer.com/journal/11069
22. Geomatics, Natural Hazards and Risk, http://www.tandfonline.com/loi/tgnh20
23. International Journal of Disaster Risk Reduction, https://www.journals.elsevier.com/international-journal-of-disaster-risk-reduction/
24. Pure and Applied Geophysics, https://link.springer.com/journal/24
25. http://www.sciencedirect.com/science/article/pii/S0377221715011479