

Course title: Urban Disaster Management and Climate Resilient Cities				
Course code: MEU 162	No. of credits: 2	L-T-P: 20-6-8	Learning hours: 30	
Pre-requisite course code and title (if any): N.A.				
Department: Sustainable Engineering				
Course coordinator: Dr Bhawna Bali		Course instructor: Dr Bhawna Bali		
Contact details: bhawna.bali@terisas.ac.in				
Course type: Elective		Course offered in: Semester 3		
Course description: The world has been witnessing increased incidences of disasters and cities that house huge infrastructure and population are vulnerable to disaster risks. This course focusses on risk reduction and management of disaster and extreme climate events in cities. The course also addresses the slow onset climate impacts on cities and its systems. It covers the critical aspect of vulnerability and risk assessment in urban areas and addresses key components relating to disaster and climate risk reduction, management and building climate resilience. The existing situation of policy and institutional mechanisms of disaster management in cities in India is examined.				
Course objectives:				
<ul style="list-style-type: none"> • To develop understanding about urban disasters and climate change. • To train students about the methods of vulnerability and risk assessment. • To equip students with knowledge on key components relating to disaster risk reduction and approaches for building climate resilient cities. • To impart knowledge on policy and institutional mechanisms for disaster management in India. 				
Course contents				
Module	Topic	L	T	P
1	Understanding Disasters and Climate Impacts a) Concept of hazard, vulnerability, risk, and disaster b) Classification of hazards and disasters c) Slow onset climate impacts d) Extreme events and disaster	4		
2	Vulnerability and Risk Assessment a) Interlinkage between development, disaster risk and climate change b) Vulnerability and risk assessment relating to slow onset climate and disaster events	4	2	8
3	Disaster Risk Reduction and Building Climate Resilience a) Disaster profile of India b) Disaster risk reduction – mitigation, preparation, response, recovery c) Climate change response – mitigation, adaptation, resilience	6	2	
4	Disaster Management in India a) Disaster Management Act b) National Disaster Management Policy c) International frameworks for disaster risk reduction	6	2	
	Total	20	6	8
Evaluation criteria: Students will be evaluated on the application of their learning across all the modules and comprising two components – group assignment and end-semester examination as per following details:				

Type and Weightage (%)

Minor Test 1: 50% - Assignment

Students will work on a select disaster event as a case study. The assignment will be based on data collected from secondary sources, literature as well as and primary data collected through field work. This assignment will comprise vulnerability assessment of the study site, description of the disaster event, response, recovery, and analysis of institutional framework (State level/district level policy) for disaster risk reduction. The assignment will be evaluated based on a presentation (20%) and a report of about 4000 words (30%). (Evaluation linked to Modules 2,3 and 4)

Major Test: 50% - Written Examination

This will be the end-semester examination. (Evaluation linked to all Modules)

Learning outcomes:

On successful completion of this course, the students will be:

1. Equipped with knowledge on disaster risk reduction and climate resilience in cities. (Evaluation criterion 1 and 2)
2. Able to apply methods used for vulnerability and risk assessment for profiling cities or study sites for disaster risk. (Evaluation criterion 1 and 2)
3. Able to evaluate policy interventions for disaster risk reduction and climate resilience. (Evaluation criterion 1 and 2)

Pedagogical approach:

The course will be delivered through a mix of classroom lectures, discussion sessions during tutorials, exposure to case studies on the theme and field work. A tutorial session will be organised at the beginning of the semester for discussing and finalising the theme of assignment and its case study area. This will be followed by tutorial sessions for discussion on the assignment to enable students to develop greater comprehension about the selected theme of their assignment and at the same time also help monitor and direct the progress of work. These discussions would facilitate and enhance peer-learning.

Materials:

1. Bicknell J., Dodman D. and Satterthwaite, D. Eds. 2009. Adapting Cities to Climate Change. Earthscan, London.
2. Blaikie, P. et al. 1994. At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge, London.
3. Birkmann, J. 2006. Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies. United Nations University Press, Tokyo.
4. Gupta, M.C., Gupta, L.C., Tamini, B.K. and Vinod K. Sharma. 2000. Manual on Natural Disaster Management in India. National Disaster Management Centre, New Delhi.
5. IPCC. 2014. Climate Resilient Pathways: Adaptation, Mitigation and Sustainable Development. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap20_FINAL.pdf
6. IPCC Reports of Working Group II. 2014 Available at: <https://www.ipcc.ch/working-group/wg2/>
7. IPCC Reports of Working Group III. 2014. Available at: <https://www.ipcc.ch/working-group/wg3/>
8. Kapur, Anu. 2010. Vulnerable India: A Geographical Study of Disasters. Sage Publications India Pvt. Ltd, New Delhi.

9. National Disaster Management Guidelines on Earthquake, Cyclone and Urban Flooding. Available at: <http://ndma.gov.in/en/ndma-guidelines.html>
10. National Disaster Management Plan. 2019. Available at: <https://ndma.gov.in/sites/default/files/PDF/ndmp-2019.pdf>
11. National Policy on Disaster Management. 2009. Available at: <http://ndma.gov.in/images/guidelines/national-dm-policy2009.pdf>
12. NIDM and UNDP. 2014. National Disaster Management: Toolkit for Urban Planning
13. NIDM and UNDP. 2014. Mainstreaming Disaster Risk Reduction in Development Planning
14. Rosenzweig C., Solecki, W. D., Hammer, S. A. and Mehrotra, S. P. Eds. 2011. Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network (ARC3). Cambridge University Press, Cambridge and New York.
15. Sharma, D. Et al. 2013. Urban Climate Resilience: A review of the methodologies adopted under the ACCCRN initiative in Indian cities. Asian Cities Climate Resilience Working Paper Series 5. IIED: London
(<http://pubs.iied.org/10650IIED.html?k=asian%20cities%20climate%20resilience%20working%20paper>)
16. Sharma, D. Raina Singh & Rozita Singh. 2014: Building urban climate resilience: learning from the ACCCRN Experience in India. International Journal of Urban Sustainable Development, DOI:10.1080/19463138.2014.937720
17. TERI. 2012. Mainstreaming Climate Resilience in Urban Areas – A Case of Gorakhpur City. TERI, New Delhi. Available at: http://accrn.org/sites/default/files/documents/Gorakhpur%20report_Synthesis.pdf
18. TERI. 2013. Climate Proofing Guwahati, Assam. City Resilience Strategy and Mainstreaming Plan (Synthesis Report). TERI, New Delhi. Available at: http://accrn.org/sites/default/files/documents/TERI_Guwahati%20Synthesis%20Report.pdf
19. TERI. 2014. Climate Resilient Infrastructure Services - Case Study Brief: Panaji. Available at: <http://www.teriin.org/eventdocs/files/Case-Study-Panaji.pdf>
20. TERI. 2014. Climate Resilient Infrastructure Services - Case Study Brief: Visakhapatnam. Available at: <http://www.teriin.org/eventdocs/files/Case-Study-Vishakhapatnam.pdf>
21. TERI. 2014. Working Paper on Planning Climate Resilient Coastal Cities: Learnings from Panaji and Visakhapatnam, India. TERI, New Delhi. Available at: <http://www.teriin.org/eventdocs/files/Working-Paper-climate-resilient.pdf>
22. TERI. Policy brief on Climate Proofing Indian Cities. Available at: <http://www.teriin.org/policybrief/docs/Urban.pdf>
23. TERI. Policy brief on Methodologies for urban climate resilience. Available at: <http://pubs.iied.org/pdfs/10655IIED.pdf>
24. UGEC. 2011. Addressing Grand Challenges for Global Sustainability: Monitoring, Forecasting, and Governance of Urban Systems. UGEC viewpoints. No.6. www.ugec.org
25. UNDP-UNEP. 2011. Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners. UNDP-UNEP Poverty-Environment Initiative. www.unpei.org.
26. UNHABITAT. 2011. Global Report on Human Settlements-Cities and Climate Change Policy Directions. Earthscan.
27. World Bank. 2010. Climate Risks and Adaptation in Asian Coastal Megacities. A Synthesis Report
28. World Bank. 2011. Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century

Additional Resources

1. Documentary Film Tales of Gorakhpur. Available at:
<https://www.youtube.com/watch?v=93P49Xy4pM8&list=PLJRwiYPH5RkTfzhCjYcSwJPCW0BLIsl14>)
2. Documentary Film Disaster Planet. Available at:
<https://www.youtube.com/watch?v=HS7amieooUM>
3. Webinar on Climate Resilient Cities. Available at:
<https://www.youtube.com/watch?v=clOiZbQI9Bs>
4. Journal of Disaster & Development, National Institute of Disaster Management, India.

Useful Web links

<http://www.accrn.org/resources>
<http://www.unisdr.org/we/campaign/cities>
<http://www.unisdr.org/we/inform/publications>
<http://www.unisdr.org/we/coordinate/hfa>
<http://www.indiaenvironmentportal.org.in/>
<http://mirror.unhabitat.org/pmss/>
<http://www.100resilientcities.org/>
<http://cdkn.org/resources/>
<http://www.apan-gan.net/>
<http://resilient-cities.iclei.org/>

Additional information (if any):NA

Student responsibilities:

Attendance, feedback, discipline: as per TERI SAS rules.

Course reviewers:

1. Dr Vishwa Bandhu Singh Chandel, Panjab University, Chandigarh
2. Dr G K Bhat, Director, TARU Leading Edge
3. Dr Anil K Gupta, Associate Professor, National Institute of Disaster Management, Government of India, Ministry of Home Affairs