

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

ID5120 – Urban Resilience

Credit Distribution: C: 9 L: 2 T: 0 P: 3 E: 0 O: 4 TH: 0

Course Type: Project

Description: The purposes of this course are to help students: Articulate resilience challenges and opportunities facing global cities, and how local and regional context shapes these resilience challenges and opportunities Describe the holistic and integrated nature of resiliency and its key drivers, and how trans disciplinary and multi-stakeholder engagement is essential for cities to shape resilience and inclusive prosperity Work in cross-institutional and cross-disciplinary teams, in both global virtual and intense face-face formats, to address specific challenges posed by the City of Chennai.

Course Content: Expected Outcomes: The students will engage with practical case studies to investigate how cities achieve goals for building urban resilience and face the challenges in complex urban systems and multi-hazard environments. The students will analyze existing tools that aim to support urban resilience, and assess the premises and approaches used. Further, the students will also examine key international urban resilience strategic frameworks including those of UN-Habitat, International Federation of Red Cross and Red Crescent Societies (IFRC), Asian Cities Climate Change Resilience Network (ACCRN) and United Nations International Strategy for Disaster Risk Reduction (UNISDR). Course Contents: Module 1: Introduction: This module provides an overview of the global situation regarding cities and climate change, global urban environment trends, advances on localization and implementation of SDGs, the New Urban Agenda, and the most recent development in the implementation of Paris Agreement. Module 2: Climate Adaptation & Resilience in Cities: This module discusses how cities contribute to climate change and on the other hand how it is impacted by climate change impacts and natural disaster events. It will also explain how sound integrated urban planning can increase climate resilience and compatibility of the city, preventing and reducing loss and damages and at the same time bring multiple benefits from of low-carbon/green infrastructure. Module 3: Urban environment and resource efficiency: This module provides the concepts in sustainable urban environment and urban environment management as well as relevant examples and case studies from the regions or cities with similar economic context. The module has a focus on the cities efficiency, green infrastructure and the circular economy approach as sound and sustainable urban environmental solutions. Module 4: Action Plan: In this last module, participants elaborate their own action plans and strategies for the implementation and localization of the SDG11 in their city, with selected integrated interventions for improving their city climate resilience, urban environment and resource efficiency.

Text Books:

- Jon Coaffee and Peter Lee. 2017. Urban Resilience: Planning for Risk, Crisis and Uncertainty. Red Globe Press. 324pp.
- Ravetz, Joe. 2016. City-region2020: integrated planning for a sustainable environment. Routledge.

- Grazia Brunetta, Ombretta Caldarice, Nicola Tollin, Marti Rosas-Casals, and Jordi Morat. 2018. Urban Resilience for Risk and Adaptation Governance: Theory and Practice. Springer. 304pp.
- India Synthesis Report - Volume I(<https://www.acccrn.net/resources/india-synthesis-report-volume-i>).
- India Synthesis Report - Volume II(<https://www.acccrn.net/resources/india-synthesis-report-volume-ii>).
- Urban Climate Change Resilience in Action: Lesson from Projects in 10 ACCCRN Cities(<https://www.acccrn.net/resources/urban-climate-change-resilience-action-lesson-projects-10-acccrn-cities>).

Reference Books: Same as above

Prerequisite: Nill