

## Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

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### **CE3241: Approaches for Sustainable Infrastructure and Environmental Systems**

**Credit Distribution:** C:9 L:3 T:0 P:0 E:0 O:6 TH:0

**Course Type:** Theory

**Description:** NIL

**Course Content:** To create awareness on concepts and issues of sustainability among students and prepare them to manage infrastructure and environmental systems. Principles and concepts, Definitions, Relevance and importance of sustainability- Resources, Interaction between environment, resource availability, demands and development, Methods and metrics, Assessment Methods such as LCA and EIA, Indices and measures of sustainability. Water and carbon footprints. Social aspects, economic principles and policy framework for sustainable development Infrastructure. Sustainable materials, Green building concepts and their construction. Environmental Systems: Sustainability issues centred around air, water, land and waste management, concept of Reduce, Recycle and Reuse. Integrated Approach to modelling sustainable infrastructure and environmental systems, Various system dynamic models, Case studies.

#### **Text Books**

- Textbook of Environmental Studies for Undergraduate Courses, Erach Bharucha, Universities Press India, 2005.
- An Introduction to Sustainable Development, Peter P. Rogers, Kazi F. Jalal and John A. Boyd, Earth Scan U.K. in association with International Institute of Environment and Development, U.S.A, 2010.

#### **Reference Books**

- Sustainable Natural Resources Management, Daniel R. Lynch, Cambridge University Press, 2009.
- Understanding Environmental Pollution, Marquita K. Hill, Cambridge University Press, 2010.
- Ecology of Industrial Pollution, Lesley C Batty, Cambridge University Press, 2010.
- Environmental Change, climate and Health, Martens P, Cambridge University Press, 2009.
- Environmental Systems, L.G. Rich, McGraw Hill publication, 1996.
- The Earth in Transition, George M Woodwell, Cambridge University Press, 2010.
- Sustainable Development in Practice, Mohan Munasinghe, Cambridge University Press, 2009.

**Prerequisite:** NIL