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Link to E-Learning Presentations/Textbooks

Urban Ecology and Environment
FRM 513

Spring 2024

Course Teacher(s)

Dr. Shah Murtaza Mushtaq
Dr. Akhlaq Amin Wani
Dr. Aasif Ali Gatoo
Dr. M. A. Islam

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Content

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1. General Information

Course code	:	FRM 513
Course Title	:	Urban Ecology and Environment
Number of credits	:	3
Course duration	:	18 weeks
Level	:	Postgraduate
Course Teacher	:	Dr. Shah Murtaza Mushtaq Dr. Akhlaq Amin Wani Dr. Aasif Ali Gatoo Dr. M. A Islam
Pre-requisite	:	Basics concepts of ecology.

2. Course description

The course introduces the basics of Urban ecosystem, cause and effects of urbanization, adaptive and resilient urban development, climate and related risks and strategic developmental management.

3. Course objectives

The course prepares students for careers as leaders in understanding urban ecology, biodiversity conservation and management for sustainable development. It prepares the students to evaluate environmental and social impacts to deal with global challenges of climate change in cites.

4. Course outcome

On completion of this course, the students would:

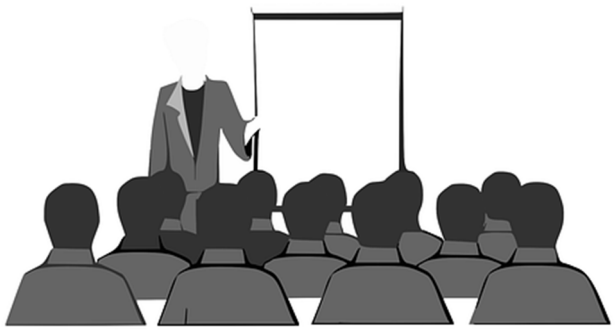
- Gain a wider understanding of urban ecological and environmental issues ranging from biodiversity to climate resilience and appreciate potential approaches for cities to deal with ecological and environmental challenges and threats of climate change.
- Enhance abilities and skills relating to evaluation of environmental and social impacts of urban development.

5. Course structure

	UNIT 1
Week1	• Concepts of urban ecology:
	• Theories of urban ecology and linkages with sustainable urbanism
Week2	• Concepts of Eco cities, smart cities, compact cities etc.
	• Challenges and opportunities of urban, rural and peri-urban growth.
	Practical: Vegetation analysis and characterization of green spaces in nearby urban areas..
	UNIT 2
Week3	Green Spaces, bio-diversity conservation and conflicts: • Urban greens: challenges and choices for management
	• Human nature interactions and urban forest management
Week4	• introduction to functional diversity and traits
	• Bio-diversity conservation conflicts
Week5	• Spatial dimensions of urban ecology
	Practical: Identifying challenges in soil waste management in nearby urban areas.
	Mid Term Exam
	UNIT 3
Week6	Urban Environment: • Introduction to urban morphology
Week7	• Industrial ecology and symbiosis
Week8	• Management of air quality and noise
Week9	• Urban solid waste management
Week10	• Urban water ecological challenges.
	Practical: Urban Risk assessment and mitigation in urban areas
	UNIT 4
Week11	Impact Analysis and Ecological Footprint Analysis: • Environmental Impact Analysis 10 25

Week12	• Social Impact Analysis and Strategic Environmental Assessment
Week13	• Urban metabolism and Ecological Footprint Analysis.
	UNIT 5
Week14	• Ecological risk assessment framework (Definition, Problem formulation, Risk analysis, Risk characterization, Risk management).
Week15	• Climate change, mitigation and adaptation
Week16	• Climate modifications and managing climate change challenges in cities
Week17	• Adaptation and mitigation measures to make cities resilient.
	• Ecosystem services and nature-based solution to address urban resilience
Week18	**Practical Exam/Assignment submission/Presentation**
	End Tem Exam

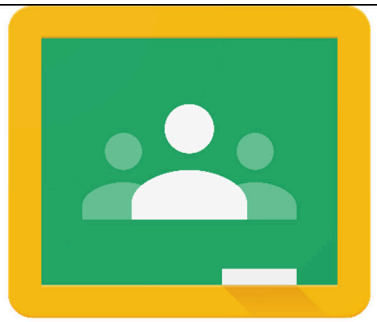
5. Course structure



In Class Lectures

Students will be able to

1) The basics of Urban ecosystem, cause and effects of urbanization, adaptive and resilient urban development,
2) Climate and related risks and strategic developmental management.

	**Lab Exercises** Students will be able to study 1) Vegetation analysis and characterization of green spaces in nearby urban areas. 2) Identify challenges in soil waste management in nearby urban areas. 3) Urban Risk assessment and mitigation in urban areas.
 Google Classroom	**On line Tutorials** **Google Class Code:** rghgtnc Students will explore and learn more about 1) Basic concepts of remote sensing, GIS and GPS and its applications through lectures notes.
	**Assignments/Presentation** Students at individual level and in groups will explore and learn more about 1) Ecosystem Services 2) Heat Island Effect 3) Air/Water/Noise Pollution 4) Urban allotment gardens-peoples motivation and practices 5) Permaculture as a potential tool for sustainable food production 6) Urban solid waste management

6. Course Assessment

Mode of assessment	% of marks
Quiz 1	5
Mid Term (Objective and Written)	20
Practical/Assignments (Discussion)	25
Quiz 2	5
End Term (Objective and Written)	45
Total	**100**

7. References

Compulsory

K Sivaramakrishnan, & Rademacher, A. (2013). Ecologies of Urbanism in India Metropolitan Civility and Sustainability. Hong Kong China: Hong Kong University Press, Baltimore

Parris, K. M. (2016). Ecology of urban environments. Chichester, West Sussex ; Hoboken, Nj: John Wiley & Sons Ltd

Keitaro Ito (2021). Urban biodiversity and ecological design for sustainable cities. Springer

Recommended

Mostafavi M. and Doherty G. (2010) Ecological urbanism, published by Baden: Harvard University Graduate School of Design.

Dale R. (2004) Evaluating Development Programme and Project, Second Edition, Sage Publication.

Morrison-Saunders A. and Arts J. (2004) (eds.) Assessing Impact: Handbook of EIA and SEA Follow-up, Earthscan James & James, London.

The World Bank (2009) Strategic Environmental Assessment in East and Southeast Asia, A Progressive and Comparison Country Systems and Cases, Washington D.C.

WWF India (2011) Impact of urbanization on bio-diversity: Case Studies From India

United Nations Human Settlements Programme (UN-HABITAT) (2011) Global report on human settlements - Cities and Climate Change: Policy Directions

Singhal, S. and Kapur, A. 2002. Industrial Estate Planning and Management in India – an Integrated Approach towards Industrial Ecology. Journal of Environmental Management, Elsevier Science Ltd., 66, 2002.

Cities and Bio-diversity Outlook (2013) Action and Policy: A Global Assessment of the Links between Urbanization, Biodiversity, and Ecosystem Services, by Secretariat of the Convention on Biological Diversity.

Adler, F. R., & Tanner, C. J. (2013). Urban Ecosystems. Cambridge University Press

E-Links to the course (Presentations)

Unit	E-Link to Course
Unit 1 **Concept of Urban Ecology**	https://drive.google.com/drive/folders/1VrPwKrY2gIH0X1dncF1nS0ZxXtUtxkEt
Unit 2 **Green Spaces, Biodiversity Conservation and Conflict**	https://drive.google.com/drive/folders/1VrPwKrY2gIH0X1dncF1nS0ZxXtUtxkEt
Unit 3 **Urban Environment**	https://drive.google.com/drive/folders/1VrPwKrY2gIH0X1dncF1nS0ZxXtUtxkEt
Unit 4 **Impact Analysis and Ecological Footprints**	https://drive.google.com/drive/folders/1VrPwKrY2gIH0X1dncF1nS0ZxXtUtxkEt