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Urban Ecosystem Management

FRM 611



Spring 2023

Course Teacher(s)

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

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1. General Information

Course code	:	FRM 513
Course Title	:	Urban Ecosystem Management
Number of credits	:	3
Course duration	:	18 weeks
Level	:	Doctoral
Course Teacher	:	Dr. M. A Islam Dr. Shah Murtaza Mushtaq Dr. Akhlaq Amin Wani Dr. Aasif Ali Gattoo
Pre-requisite	:	Basic knowledge on urban ecology.

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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 concept and management of complex and dynamic urban ecosystem.

4. Course outcome

On completion of this course, the students would:

- Learn about fundamental concepts and processes associated with urban and peri-urban environments.
- Learn and experience the concepts of vulnerability, exposure, mitigation, adaptation, resilience and Urban Climate Change.
- Develop an understanding of establishment and maintenance of urban green infra-structure.
- Understand strategic management dimensions and policy strategy framework for urban resilience

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5. Course structure

	UNIT 1
Week1&2	Understanding Urban Ecosystem: Fundamental concepts and processes associated with urban and peri-urban environments.
Week3&4	<ul style="list-style-type: none">Urban sprawl – Challenges and need for resilience: Urbanization – trends, causes, effects, and requirements of urban and peri-urban climatic resilience and adaptation.
	Practical: Practical exercise to assess spatial and temporal urban sprawl in the nearby urban and peri-urban areas.
	UNIT 2
Week5	Contexts of adaptive and resilient urban and peri-urban development: Adaptive development needs,
Week6	scope and opportunities in urban and peri-urban systems management.
Week7&8	Urban and peri-urban water, temperature, winds, and health risks: Key dimensions of climate and extreme events, related disaster risks and vulnerability in an urban and peri-urban context.
	Practical: Field exercise to assess factors responsible for urban sprawl.
	Mid Term Exam
	UNIT 3
Week9	Green infrastructure (GI): Concept, elements,.
Week10	Role of GI in protecting ecosystem and biodiversity
Week11	Green Infrastructure management: Establishment and maintenance of trees as beneficial components of urban environments.
Week12	Tree functionality (biological, social, environmental and economic opportunities and constraints).
Week13	Management of trees and wooded areas within ecological urban and peri-urban landscapes.
Week14	
	Practical: Characterizing green infrastructure in the nearby urban and peri-urban areas.
	UNIT 4
Week15	Strategic management of risks with green growth and ecosystems: Strategic management framework addressing sustainable and resilient urban development.

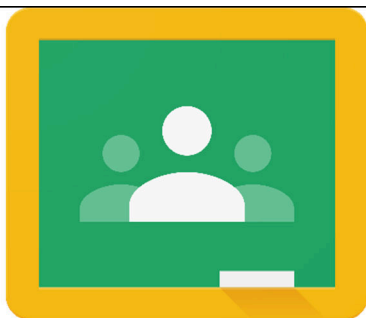
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Week16	Policy-planning-practice linkages: Role of planning,
Week17	Urban and peri-urban ecosystem and green growth strategies.
Week18	Practical Exam/Assignment submission/Presentation
	End Tem Exam

5. Course structure

	<p style="text-align: right;">In Class Lectures</p> <p style="text-align: right;">Students will be able to</p> <ol style="list-style-type: none"> 1) Understand the concept and management of complex and dynamic urban ecosystem.
	<p style="text-align: right;">Lab/Field Exercises</p> <p style="text-align: right;">Students will be able to study</p> <ol style="list-style-type: none"> 1) Spatial and temporal urban sprawl in the nearby urban and peri-urban areas. 2) Factors responsible for urban sprawl. 3) Characterizing green infrastructure in the nearby urban and peri-urban areas



Google Classroom



On line Tutorials

Google Class Code: yv5mdjj

Students will explore and learn more about

- 1) Concept and management of complex and dynamic urban ecosystems through lecture notes.

Assignments/Presentation

Students at individual level and in groups will explore and learn more about

- 1) Field studies to identify and explain the relationships among urban and peri-urban area.
- 2) Possible causal-loop (tool) scenarios for climate and disaster risks and resilience
- 3) Components of vulnerability i.e. exposure, sensitivity & adaptive capacity
- 4) Basic and modelling of urban ecosystems management
- 5) Presentation and discussion.



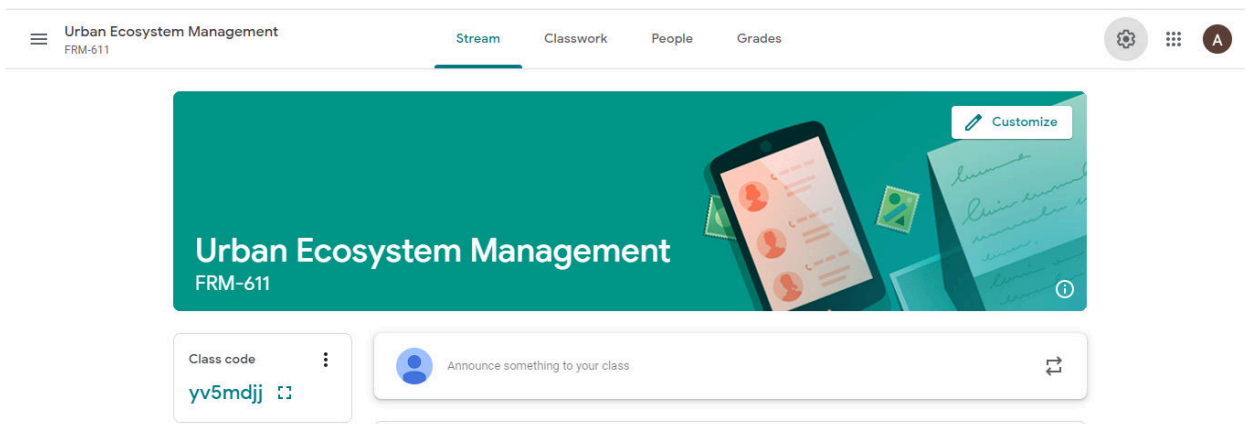
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Online tutorials



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

Elmqvist et al. (2013). Urbanization, Biodiversity and Ecosystem Services: Challenges and Opportunities.

SpringerLink. <https://doi.org/10.1007-978-94-007-7088-1>

Blue-Green Infrastructure across Asian Countries. (2022). SpringerLink. <https://doi.org/10.1007-978-981-16-7128-9>

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

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Gupta, A. K., S S Singh, S A Wajih, N. Mani and A.K. Singh, 2017. Urban Resilience and Sustainability through Peri-urban Ecosystems. GEAG, ACCRN & Rockefeller Foundation.

Recommended

“City Resilience Framework” ARUP, December 2015, Available at

<https://assets.rockefellerfoundation.org/app/uploads/20140410162455/City-Resilience-Framework-2015.pdf>

Cities, Towns, Regions Partner to Help Achieve Paris Goals”, Article, UNFCCC, 10 November 2016, available at

Making our cities smart and resilient”, Raina Singh, 3 March 2018, available at www.teriin.org/article/making-our-cities-smart-and-resilient.

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