Spring 2024
Tue-Thu 8:30-9:50
Gould 100

URBDP 498A / 534A ENVIRONMENTAL PLANNING
Strategies for integrating complexity theory and ecology in resilience planning

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DESCRIPTION

This course places cities and urban regions in the context of Earth's eco-evolutionary dynamics. The focus is on the integration of principles of complex systems, ecosystem dynamics, and resilience into planning and decision-making. The central theme is the critical nexus among climate change, biodiversity, and social equity in designing resilient urban systems. To bridge theory with practice, the course prompts critical inquiries such as: How can urban planners design and implement infrastructures that are resilient in the face of uncertainty and capable to adapt to a spectrum of future climate scenarios? How can we effectively coordinate the action of multiple stakeholders operating at many scales under diverse constraints? And how do we ensure a just and equitable transition towards a sustainable and resilient urban future? The course is structured around four modules: 1) theories of environmental planning, 2) methods of environmental assessment, 3) modeling and scenarios and 4) collaborative adaptive planning. These modules are used to identify and address critical transitions, and to develop strategies that promote socio-ecological resilience. Students will learn how to create scenarios, construct integrated models, assess resilience, and devise environmental management strategies through practical applications. The course incorporates a variety of approaches, such as system thinking, simulation modeling, strategic foresight, place-based analysis, life-cycle analysis, risk assessment, and adaptive management.

LEARNING OBJECTIVES

1. Apply complex systems theories and ecology to urban resilience planning, recognizing the interdependence of human and ecological systems.
2. Design adaptable blue/green infrastructure informed by strategic foresight to anticipate and thrive under various climate futures.
3. Utilize simulation modeling and scenario planning for resilient decision-making in the face of uncertainty.
4. Coordinate multi-stakeholder actions, assess tradeoffs, and address and resolve conflicts to implement equitable and sustainable urban strategies.
5. Promote urban designs that foster ecological and social resilience, prioritizing justice and sustainability in the transition of urban environments.

PRACTICUM

In the practicum, student teams will employ scenario planning and simulation modeling to investigate the interplay between climate change, biodiversity, and social equity within urban planning frameworks. The objective is to explore how alternative urban patterns and urban infrastructure systems impact human and ecological health and wellbeing, and to formulate hypotheses on the attributes that enhance urban resilience. Through case studies, students will evaluate system resilience and capacity for innovative solutions, gaining practical knowledge in developing future scenarios to integrate climate change, biodiversity, and social equity considerations into decision-making processes. Our goal is to formulate actionable principles to apply resilience science to environmental design and planning practices.

PARTICIPATION AND ASSIGNMENTS

This course is organized into four modules. Each module consists of 2 lectures and 2 practicum sessions over a span of two weeks. Students are required to complete the required readings, participate in class discussions and practicum exercises. Students individually will compose three memos linking theoretical concepts from each module to practical strategies and principle of environmental planning. Students will also work in teams on team scenario planning projects and will produce three team assignments that will serve as the basis for a 20-page final team report describing developed scenarios and strategic plans and give a 30-minute presentation of their findings. Students are also expected to participate in a simulation game.

PERFORMANCE

Students are expected to successfully complete all required assignments.

1. Complete all assigned readings prior to class.
2. Participate in all class discussions of reading related questions.
3. Compose three individual memos reflecting on key theoretical concepts.
4. Collaborate in writing three team assignments.

5. Participate in simulation game.
6. Participate in a 30-minute team presentation.
7. Write a twenty-page team report.

Your performance will be evaluated according to four criteria:

1. How regularly and actively you participate in team-work.
2. How appropriate and thoughtful is your approach to the problems.
3. How well informed and supported is your analysis for the report.
4. How well organized and clear is your presentation of ideas in the presentation.

Grades will be calculated based on the following criteria

Memos	30%
Team Assignments	30%
Report	30%
Presentation	10%

READINGS

This course has a series of required (→) and recommended (+) readings. The readings are available on canvas and on the library on-line system. The books are on 4-hour reserve at the library. Required readings should be completed prior to the lectures as indicated below. A few additional readings may be provided.

DISCUSSIONS

Each lecture is supported with several current articles of varied topics from ecology to modeling and political science. Is essential that everyone read the material to engage in class discussions. Each module is structured to include an in-class discussion and an individual memo to explore the key topics. In class discussion(s) will occur during the last 20-30 minutes of the lecture sessions. Memos are intended to help students link theory to practice. On-line discussions and memos should help in writing the final paper, but more importantly they should help students understand why (and be able to clearly articulate this message to decision makers) integrating uncertainty and complexity through scenario planning with adaptive management is essential to effective ecosystem management and environmental planning.

MODULE	WEEK	DATE	DAY	ASSIGNMENTS
INTRO	1	March 26, 2024	T	Ecology for an Urban Planet
		March 28, 2024	Th	Introduction to the Practicum
				Class Exercise: Imagining the Future
1 THEORIES	2	April 2, 2024	T	Complexity of Hybrid Ecosystems
		April 4, 2024	Th	Planning for What Future
				A1: Driving Forces (In class)
	3	April 9, 2024	T	Regime Shifts in Urban ecosystems
		April 11, 2024	Th	Invited Speaker
				A1: Driving Forces (Due today on Canvas)
2 METHODS	4	April 16, 2024	T	Scenario Planning
		April 18, 2024	Th	Developing Resilience Hypotheses
				A2 Scenario Logics (In class)
	5	April 23, 2024	T	Urban Eco-Evolutionary Dynamics
		April 25, 2024	Th	Invited Speaker
				M2 Scenario Methods (Due today on Canvas)
3 MODELS	6	April 30, 2024	T	Prediction in Environmental Planning
		May 2, 2024	Th	Selecting Indicators of Resilience
				A3: Resilience Indicators (In Class)
	7	May 7, 2024	T	Resilience Indicators
		May 9, 2024	Th	Singapore Green Plan
4 PLANNING	8	May 14, 2024	T	Managing Coupled Human-Ecological Systems
		May 16, 2024	Th	Role-Play Simulation
				M3: Resilience principles for Planning (Due today on Canvas)
	9	May 21, 2024	T	Planning Under Uncertainty
		May 23, 2024	Th	Team Projects Reviews
		May 28, 2024	T	Learning from the Future
		May 30, 2024	Th	Prepare reports