

FoodCycle: Systems Thinking toward Circular Economy for Organic Resources

Fall 2022

IARD 3030/5030

Tuesdays: 11:20 – 12:10 & Thursdays: 11:20 – 1:15

Plant Science Building 143

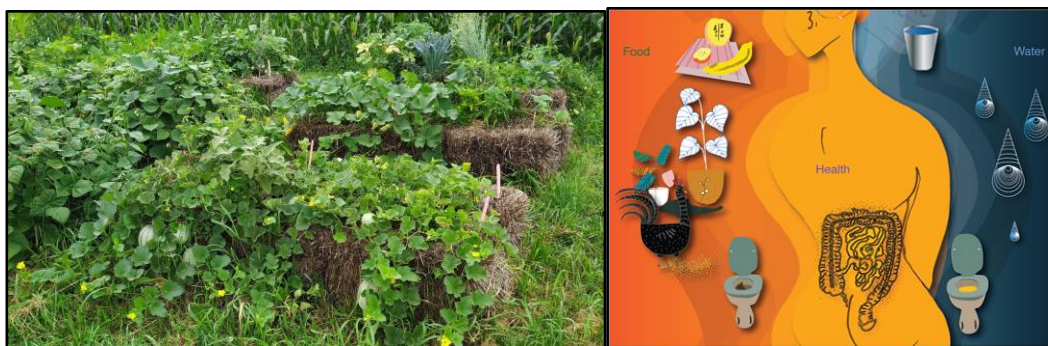


Photo: Rebecca Nelson

Art: Tejas Sharma

Instructor: Rebecca Nelson, rjn7@cornell.edu; (607) 280-0062

Office Hours: By appointment (325A Plant Science or Zoom)

Teaching Assistant (TA): Alexandra Gearing, ame227@cornell.edu; (724) 984-4229

Office Hours: 11:30am-1:30pm and by appointment (Warren Hall 142 or Zoom)

COURSE DESCRIPTION

How can systems thinking help us understand issues and opportunities at the nexus of agriculture, sanitation, water, health, climate change and the natural and built environments?

Through a semester of interdisciplinary lectures, discussions and labs, students will grapple with this question and gain skills in systems analysis, participatory design and systems change. Coursework will be both individual and collaborative, and include constructing systems models, learning from cases and literature in multiple contexts. To ground this global perspective, the Cornell campus will be considered a "living laboratory" for an inquiry into how organic resources flow through social institutions, and how waste flows might be utilized to produce energy, fertilizer, food, building materials and/or other valued products. Students will have the opportunity to engage with local organizations and in hands-on work to learn about ways in which organic resources can be up-cycled.

The course combines lecture/discussions (Tuesdays) with non-lecture ("lab") sessions (Thursdays).

The lectures will be complemented by discussions that emphasize the co-creation of knowledge among members of the class. Both lectures and lab sections will be occasionally led (see reading schedule) by guest instructors who are experts in the specific topic of the week. Lab sessions are designed to build skills in relation to the foundational material covered in the lectures and will include the development of systems models, field trips, and other activities as listed so that students may engage in hands-on work to learn about ways in which systems thinking and circular economy might be applied tangibly.

LEARNING OBJECTIVES

- To master concepts and skills related to systems thinking, analysis and intervention, including powerful patterns of thought and the ability to understand and design pathways to change in diverse contexts.
- To understand and appreciate the concepts around “Circular Economy” and its relevance to global issues (sustainability, food systems, etc.).
- To understand systems related to organic resource management, such as those involved in food, agriculture, sanitation, the built environment, and health-related surveillance.
- To analyze and conceptualize context-related similarities and differences that influence problems, opportunities and pathways to change.
- To identify a relevant issue or opportunity, learn about it, and develop a coherent and insightful oral and written presentation on the topic.

ASSIGNMENTS

Title and basics	More info	Due dates	Submission & format instructions	% of grade
Course Journal Your written reflections for each class session. Each journal submission should help you to reflect on the specific class topic <i>and</i> develop a component of your class project.	Prompts for the reflections can be found linked to each class module on Canvas. The final portfolio of journal entries should be used/useful to the completion of your final project.	Reflection 1: Mondays by 5 pm Reflection 2: Fridays by 5 pm	Please submit through the assignment link on Canvas. Entries should provide a bibliography of cited work, and be between 350-500 words.	30
Systems Models This is a group activity and an individual product. Your team will choose a system of mutual interest and make a series of visual depictions of the chosen system.	During three of the lab sessions, students will collaborate to produce collective systems models that addresses an organic resource challenge of mutual interest.	Your model suite, due Monday, Oct 3rd	System model – Developed collectively in Lab Sessions during labs 3b, 5b and 6b. Revised and personalized individually and submitted as Draw.io files (can be complemented by photos of hand-drawn maps).	5
Class Participation Active participation in class discussion is required!		Each session	Students are asked to comment on readings and more. Journal entries will help students pull their key thoughts together before class.	10
Final Project - a set of assignments is outlined below				
Project Pitch	You will be asked to submit written	Written Proposal/ Powerpoint:	Submission to Canvas:	10

You will present your own project ideas to the class for feedback from instructor and peers.	feedback to another student.	Before Class Thursday, Oct 6th 4 min Oral Presentation: Thursday, Oct 6th in Class Any changes to proposal after presenting: Friday, Oct 7	1-2 page project proposal with driving challenge; research question; context; methods; key resources; and communication plan 4 minute in-class presentation	
Peer feedback	Feedback should reflect the expectations for the final project, as well as your general suggestions.	Written Peer Feedback: Friday, Oct 14th	Written feedback to one other person. Submitted via email to peer and Canvas for teaching team.	5
Costs and benefits	On Nov 10th, students will discuss the costs and benefits related to their project.	Come prepared with thoughts and questions	1-page analysis of costs and benefits of your project idea is due Nov. 11	5
Individual Project Presentations	This is your chance to share your insights with your peers.	Tuesday, Nov 29th & Thursday, Dec 1st in class	Both a video and a live presentation are required. The video can serve as a practice talk!	15
Final Submission	Bring it all together!	When final exam is scheduled (date released in early October)	Written document, drawing on journal entries and other resources.	20

SCHEDULE OF TOPICS AND READINGS *[Please check Canvas for the details on readings and activities; these are subject to change up to a week before any deadline.]*

Week	Date	Topic	Lead instructor	Readings / assignments Se CANVAS for details
1a	Aug 23	Overview	Rebecca Nelson	Syllabus
1b	Aug. 25	Taxonomy of interests; form initial groups; start to list elements of system	Rebecca Nelson	Reflections due Friday, Aug 26.
2a	Aug. 30	Circular economy (CE)	Rebecca Nelson	Reflection due Mon, Aug 29.
2b	Sept. 1	Composting facility	Jean Bonhotal	Reflection due Friday, Sept 2.
3a	Sept. 6	Systems thinking	Rebecca Nelson	Reflection due Mon, Sep 5.
3b	Sept. 8	System mapping - group work	Rebecca Nelson	Work in groups on the topic you identified in Week 1 (the topic can evolve) Reflection due Friday, Sept 9.
4a	Sept. 13	Black soldier flies	Jesus Orozco (RJN)	Reflection due Mon, Sep 12.
4b	Sept. 15	Visit to Caldwell and Dilmun	Rebecca Nelson	Reflection due Friday, Sept 16.
5a	Sept. 20	How change happens	Rebecca Nelson	Reflection due Mon, Sep 19.
5b	Sept. 22	Theory of change	Rebecca Nelson	Reflection due Friday, Sept 23.
6a	Sept. 27	Food systems	Alex & Rebecca (Teaching Team)	Reflection due Mon, Sep 26.
6b	Sept. 29	Food systems mapping, last session (please bring your computer!)	Rebecca Nelson	Reflection due Friday, Sept 30.
7a	Oct. 4	Food waste	Rebecca Nelson	Reflection due Mon, Oct 3.
7b	Oct. 6	Project Pitches/Oral Presentations	Class	Written project pitch (proposal) due before class October 6th; final (revised if desired) is due

				Friday, Oct 7 (no additional reflection requested this week).
No Class	<i>Oct. 11</i>	FALL BREAK	FALL BREAK	No reflection due.
8b	Oct. 13	Systems tools for participatory systems analysis and change	Erika Palmer	Your Peer Feedback is due on Friday Oct. 14 (email to the peer and submit on Canvas for the Teaching Team). No reflection due on Friday.
9a	Oct. 18	Behavior change	Kate Dickin	Reflection due Mon, Oct 17.
9b	Oct. 20	Participatory methods	Rebecca Nelson	Reflection due Friday, Oct 21.
10a	Oct. 25	Sanitation	Ed Gottlieb	Reflection due Mon, Oct 24.
10b	Oct. 27	Visit to WWTF	Ed Gottlieb	Reflection due Friday, Oct 28.
11a	Nov. 1	Soil	Teaching Team	Reflection due Mon, Oct 31.
11b	Nov. 3	Visit to Leland Biochar facility	Akio Enders	Reflection due Friday, Nov 4.
12a	Nov. 8	Circular architecture	Felix Heisel	Reflection due Mon, Nov 7.
12b	Nov. 10	LCA - discussion of papers. MycoBuilt show and tell	Rebecca Nelson	Come prepared to class to discuss the cost benefits of your project. One-page cost and benefit description is due Nov. 11.
13a	Nov. 15	Ecological sanitation (19 Nov = World Toilet Day)	Teaching Team	Reflection due Mon, Nov 14.
13b	Nov. 17	Visit to The Soil Factory	Nance Klehm	Reflection due Friday, Nov 18.
14a	Nov. 22	Reality check	Panel	Reflection due Mon, Nov 21.
No Class	<i>Nov. 24</i>	THANKSGIVING DAY	THANKSGIVING	
15a	Nov. 29	Individual Project Student Presentations	Class	
15b	Dec. 1	Individual Project Student Presentations	Class	

GUEST INSTRUCTORS

[Jean Bonhotal](#), Director of Cornell Waste Management Institute, Soil and Crop Sciences Section
School of Integrative Plant Science

[Ed Gottlieb](#), Industrial Pretreatment Coordinator & Safety Manager for Ithaca Area Wastewater
Treatment Facility

[Akio Enders](#), Research Support Specialist (Lehman Lab), School of Integrative Plant Science, Soil
and Crop Sciences Section

[Eric Harrington](#), Director of Occupational and Environmental Health, Office of Capital Projects
and Facilities Services

[Andrew Murphy](#), Environmental Engineer and Manager Hazardous Materials Services

[Kate Dickin](#), Associate Professor, Department of Population Medicine and Diagnostic Sciences

[Felix Heisel](#), Assistant Professor Department of Architecture

[Nance Klehm](#), Social Ecologies, Illinois.

CLASS POLICIES & NOTES ON RESOURCES

Discussion and attendance. This course is a seminar, with an emphasis on collective learning through in-class discussions. Two classes can be missed without losing participation points. To achieve the best experience for all members of the class, it is essential that everyone come on time and be prepared to engage with the readings, your classmates, and the instructors. Your participation grade therefore includes timely attendance and active engagement with activities and discussion. If you are unable to attend class due to an emergency, it is your responsibility to notify Rebecca and Alexandra as soon as you can.

Public domain notification. All writing produced for this course may be read and shared by all members of the class for instructional purposes. Student work may also be shared, anonymously and with permission, with colleagues for pedagogical and program assessment purposes only.

Communication. The teaching team (Rebecca and Alexandra) will communicate with you through the course Canvas site, complemented by email. If you have questions, ask us in person or over email; I will respond to emails within 24 hours (excluding weekends). If you would like to meet and can't make office hours, email me to find another time. You will have a chance to

provide feedback halfway through the semester in a required one-on-one conference about what's working and what's not.

Personal electronics. This is a tough one, because there are good reasons to be on your laptop or phone during class. But research and personal experience show clearly that it's best to be off your devices during class. We will use these technologies for various purposes, but the use of cell phones and lap tops is prohibited, unless specified for an in-class activity.

Academic integrity. Students who use facts or ideas originating with others must plainly distinguish what is theirs from what is not. To misrepresent one's work knowingly is to commit an act of theft. To misrepresent one's work ignorantly is to show oneself unprepared to assume the responsibility presupposed by work on the college level. It should be obvious that none of this prohibits making use of the discoveries or ideas of others. What is prohibited is simply improper, unacknowledged use (commonly known as "plagiarism") (Cornell Law School Code of Academic Integrity 2011-12, p18).

In other words, plagiarism is prohibited and ignorance of citation conventions is not an acceptable excuse. Check out Cornell's Code of Academic Integrity (<http://cuinfo.cornell.edu/aic.cfm>), the library website for how to cite sources properly (www.library.cornell.edu/research/citation), and/or ask me for help if you're not sure how and when to acknowledge the ideas of others.

Intentional cheating will result in a zero for the assignment and may result in a zero for the class. Violations will be handled according to university procedures.

University policies and regulations. As your instructor, I respect and uphold university policies and regulations pertaining to the observation of religious holidays; assistance to physically handicapped, visually and/or hearing-impaired students; plagiarism; sexual harassment; and racial or ethnic discrimination.

Students with disabilities. Please be in touch within the first three weeks of the semester if you need accommodations for any special needs, academic or otherwise. You are encouraged to register with Student Disabilities Services to verify your eligibility. See <http://sds.cornell.edu> for more information.

Writing support. The Knight Institute Writing Walk-In Service (WWIS) provides free support for students at any stage of the writing process. The WWIS is open Sunday through Thursday 3:30–5:30 p.m. and 7:00–10:00 p.m., at five different campus locations. Students can schedule appointments or drop in at a convenient time. For more information, see www.arts.cornell.edu/