ENVIRON 462-001 EAS 528-001 NUTR 555-001 URP 427-001 URP 527-001
Foundations of Sustainable Food Systems

Fall 2021

(Draft, subject to change with two-week notice)

Location: Dana Building 1024
Meeting times: 1:00PM – 2:30PM, Tuesdays and Thursdays
Credits: 3
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Lesli – Sign up for office hours: https://calendly.com/leslihoey/office-hours
Mondays – 11:30a.m. to 12:30 p.m. (virtual)
Tuesdays – 11a.m. to Noon (virtual or in person*)
Thursdays – 10:15a.m. to 11:15a.m. (virtual or in person*)
*Room 2366 (new wing), Art & Architecture Building, 2000 Bonisteel, North Campus

Course Summary

Today we have entered a new geological epoch – the Anthropocene – characterized by unprecedented human alteration of global processes. This fast-paced global change both affects and is affected by agriculture and broader aspects of food systems. Concurrent food, energy, water, and climate crises, and a global rise in obesity amidst widespread hunger and undernutrition have re-focused public attention on the deficiencies and complexities of the global food system. The dominant industrial food system is increasingly resulting in well-documented social, ecological, and health-related costs. Yet, a diversity of 'alternative' food systems demonstrates that agriculture and food systems can be resource conserving, equitable, and health promoting.

Increasing food system sustainability requires interdisciplinarity along multiple dimensions: reconnecting agriculture with ecological systems, reshaping food production systems to be more nutrition-sensitive, and ensuring that policies and institutions that impact the food system safeguard social equity and the environment. Linking theory and practice is also essential, involving the diverse range of actors moving food from farm to fork. As a result, demand is growing for interdisciplinary scholars and other professionals who are equipped to analyze and address the complex challenges of sustainable food production and global food and nutrition security.

This course will offer a unique opportunity for students to gain interdisciplinary knowledge of food systems and to integrate theory and practice through experiential learning and dialogue-based inquiry. Interdisciplinary research and education require bridging worldviews and recognizing the values implicit in different disciplinary and theoretical perspectives. This course will incorporate multiple perspectives, from local to global levels, as well as an understanding of how those perspectives are underpinned by different epistemologies and value systems. That is, this course directly engages with values, exploring how they shape food systems. Benefitting from collaborative

interdisciplinary instruction that draws on the expertise of three professors from three different departments, students will develop competencies and cognitive skills in the area of food system sustainability including critical and systems thinking, creativity, and analytical ability.

Course objectives

During this course, students will:

1) study the characteristics, outcomes, objectives, and values of different contemporary food systems in the Global North and South;
2) analyze and critique peer-reviewed literature examining the processes and outcomes of food systems models through an interdisciplinary lens;
3) practice communicating ideas about food systems in oral presentations to peers;
4) participate as a member of a multidisciplinary team;
5) explore their own and others' diverse values and viewpoints about food systems based on supporting evidence.

Course competencies

Upon completion of this course, students will be able to:

1) describe key concepts across disciplines and perspectives related to sustainable food systems;
2) apply systems thinking tools to the analysis of food systems issues including those related to agroecology, public health, and food policy and planning;
3) evaluate assumptions and values about food systems that underpin one's own thinking and that of others;
4) apply and synthesize scientific evidence in support of arguments that address food systems research questions;
5) analyze and critically evaluate food systems research results and policies for evidence-based assessments and ethical decision-making;
6) communicate clearly and effectively about food systems through writing and oral presentations in a professional setting of diverse peers; and
7) engage in respectful dialogue, collaborative teamwork, and problem-solving with those of differing viewpoints and backgrounds.

Suggested prior coursework

Because this course is open to students from different academic disciplines and professional backgrounds, and because it is available to both upper-level undergraduate students and graduate students, we expect that enrolled students will bring with them a diversity of skills, knowledge and practical experiences that will broadly benefit the entire class. For these same reasons, however, it is unrealistic to expect that every student should have completed a similar curriculum prior to enrolling in this course. We suggest, though, that students will benefit from having completed one or more of the following courses prior to joining this class: an introductory course in biology, environmental science, ecology, urban planning, food policy, epidemiology, and/or human nutrition.

Class format

We will meet in-person for most class sessions. However, 5 class sessions are currently planned to be held virtually on Zoom (Meeting ID: 972 2832 6258), including three days to work in class on an interdisciplinary group assignment and two class periods with outside speakers. The in-class vs. virtual format of the class is subject to change.

Class schedule in brief

Week	Date	Topic	Assignments due
UNIT I: INTRODUCTION TO SYSTEMS THINKING, SUSTAINABILITY AND GLOBAL FOOD SYSTEMS			
1	August 31	Course introduction	
	September 2	Interdisciplinarity and systems thinking	
2	September 7	Food systems history	
	September 9	Food systems career and innovations panel (virtual)	
UNIT II: FARMING SYSTEMS AND THE ENVIRONMENT			
3	September 14	The ecosystem concept and management paradigms	
	September 16	Nutrient cycles and soil fertility	
4	September 21	Biodiversity and agroecosystem function	
	September 23	Agriculture and climate change	Group project topic survey
5	September 28	Unit II case study: Nutrient pollution from the Mississippi River Basin and Gulf Hypoxia	
	September 30	Intro to problem-based learning research projects; problem-based learning in-class activity I (virtual)	
UNIT III: THE INTERACTION OF FOOD SYSTEMS AND HUMAN NUTRITION			
6	October 5	Sustainable food systems and healthy diets: Key issues	Unit II capstone assignment
	October 7	Sustainable diets	
7	October 12	Agrobiodiversity and healthy diets	
	October 14	Lecture: TBD	
8	October 19	**FALL STUDY BREAK: NO CLASSES**	
	October 21	Unit III debate: TBD	
9	October 26	Guest speaker (virtual): TBD	
	October 28	Problem-based learning in-class activity II (virtual)	Unit III capstone assignment
UNIT IV: FOOD POLICY and PLANNING			
10	November 2	National US food system policies	
	November 4	Regional and local food systems planning	
11	November 9	Urban agriculture and food environments	
	November 11	Policy advocacy and social movements	
12	November 16	Problem-based learning in-class activity III (virtual)	
UNIT V: GLOBAL SYNTHESIS, STUDENT PRESENTATIONS AND COURSE WRAP-UP			
12	November 18	Unit IV case study: TBD	
13	November 23	Food systems & COVID-19 integrated lecture	
	November 25	**THANKSGIVING: NO CLASSES**	
14	November 30	Student presentations	Unit IV capstone assignment
	December 2	Student presentations	
15	December 7	Student presentations	
	December 9	Global synthesis lecture and discussion; course wrap-up	Final project report

Assignments

Individual assignments

Reading reflections
Students are expected to complete the assigned (required) readings and be prepared to critically discuss them in class. Students are also expected to prepare 1-2 reflection questions in response to the readings from **5 classes** of their choosing and post them under the "Discussions" tab of the course Canvas site under "Reading reflection questions" by 11:59PM the day before the class readings are due. The classes for which you choose to write reflection questions cannot be classes in which the panel discussion, guest speaker, case studies, debates, or problem-based learning activities take place, which leaves you with 15 classes for which you can write a reflection. Out of your 5 responses, ***at least one set of reflection questions must be for each of the Units II, III and IV.*** Reflection questions should not merely be aspects of the readings that were not clear to you – they are meant to be provocative conversation starters. We will select some of your questions to integrate into lectures or to stimulate discussion within small groups or class as a whole. Submission of these reflection questions will contribute to your participation grade.

Unit capstone assessments
At the end of Units II, III, and IV, students will complete a take-home assessment consisting of three short-answer questions that will require students to critically apply concepts from the readings and lectures of the unit. Students will be provided the take-home assessment at the end of the unit and will have one week to complete the assessment. The completed assessment must be turned in on Canvas before the start of class on the day indicated in the syllabus.

Interdisciplinary group assignment
Problem-based learning research project
During the term, interdisciplinary groups will work together on an assigned research project that applies a problem-based learning approach. Instructors will form the groups and introduce the assignment in more detail on **September 30**. In late September, students will be able to identify the topics they would prefer to work on. Groups will work on this project largely outside of class, but three days are allotted, at the end of Units II, III and IV, to work on different components of the project together virtually during class and to receive feedback from the instructors. You will be given instructions about what to expect for those components at the start of each unit. These initial components will be graded as pass/fail. If groups do not come prepared, a "fail" grade means that their final paper will lose a third of a letter grade. Groups will present their proposal and findings to the class on either November 30, December 2 or December 7. A final report will also be due by the start of class on the last day of the term (5-7 pages, single spaced, 12-point font). Members of each group will carry out an evaluation of their peers within their groups at the end of the semester. This evaluation will contribute to students' participation grade.

Grading

Participation (i.e. attendance, group work, etc.):	15 points
Unit capstone assessments (15 points each):	45 points
Final group project (presentation):	15 points
Final group project (written report):	25 points
Total points possible:	**100 points**

Letter grades will be assigned based on the following cut-offs:

A+	97% or greater	B-	80-82.9%
A	93-96.9%	C+	77-79.9%
A-	90-92.9%	C	73-76.9%
B+	87-89.9%	C-	70-72.9%
B	83-86.9%		

A Rubric for Evaluation of Participation

A significant portion of your grade for this class (15%) is based on your participation in class discussions (including your reading and reflection question postings), activities, group peer evaluations, and the class sessions devoted to the problem-based research projects. Participating in this class does not always mean talking a great deal. An important part of satisfactory participation in this class is your active role in creating, and engaging in, a community of learners. It entails your building on and synthesizing comments and contributions from others, and on showing appreciation for others' involvement. Some of the most helpful things you can do are to bring a new resource to the classroom or highlight something interesting and compelling you witness in others. There are multiple ways that quieter learners can participate. Below are some *specific* examples of high-quality participation we will be observing and noting:

- ***Attend each class, on time***.
- ***Please do not use your phone*** during class, since if you are "there," you are not "here" with us.
- ***Your laptops are only to be used if you are taking notes or doing project work***, and are not appropriate for social media, email, and other personal uses.
- ***Change seats often*** to get to know every student. One of our goals is to create a cohesive learning community. You may learn the most from someone with whom you do not initially connect.
- Ask a question or ***make a comment that shows you are interested*** in what another person says, or does, and/or encourages another person to elaborate on something they have already said or done.
- ***Alert us to a resource*** (a reading, website, video) not addressed in the syllabus that adds a new dimension or perspective to our learning.
- ***Make a comment that underscores the link between two or more students' contributions*** and make this link explicit in your comment. Contribute something that builds on, or springs from, what someone else has said or done.
- If you think it is appropriate, ***ask the group for a pause*** to slow the pace of conversation or activity to give you, and others, time to think/process, especially during our activities.

- ***Make a summary observation*** that considers several people's contributions, and which ***touches on a recurring theme*** in a discussion or of our work together.
- Find a way to ***express appreciation for the learning*** you have gained from a discussion or from our group work together. Try to be specific about what it was that helped you understand something better.
- ***If you have a critical comment, make it diplomatically***, focusing on the issue at hand, and not on the people with whom you have a differing viewpoint.

To be effective, many of the above can be done one-on-one, or in small groups. You do not always have to speak in front of the entire class, particularly since we have a large class size. There are many ways in which students who are more comfortable with small groups can participate. We will use this rubric to assess your participation during this course.

Accommodations for students with disabilities
In compliance with the University of Michigan Rackham Graduate School policy, we are available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Office of Services for Students with Disabilities to determine eligibility for appropriate accommodations. See: http://www.rackham.umich.edu/policies/accommodations_for_graduate_students_with_disabilities/.

Academic Integrity
"The conduct of a student registered or taking courses at the University of Michigan should be consistent with that of a professional person. Courtesy, honesty, and respect should be shown by students toward faculty members, guest lecturers, administrative support staff, and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for their ideas and opinions and striving to help them achieve maximum benefits from their experience.

Student academic misconduct refers to behavior that may include plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials (including library materials), and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student's own effort. Reference sources should be indicated clearly. The use of assistance from other students or aids of any kind during a written examination, except when the use of aids such as electronic devices, books or notes has been approved by an instructor, is a violation of the standard of academic conduct (Standard of Academic Conduct, University of Michigan School of Public Health)." Source: Advisory Committee on Academic Programs (ACAP).

If you are concerned that you might be plagiarizing – using the words, data, images or ideas of others without clear attribution – you probably are. As a member of the university community, and student in the Rackham School of Graduate Studies, you are bound by their respective rules and regulations on Academic and Professional Integrity, which includes documenting the use of

source materials. If you are confused, speak to one of the instructors. The following websites are useful:

- University of Michigan's policies on academic and professional misconduct, https://rackham.umich.edu/academic-policies/section8/
- UM Urban Planning professor Scott Campbell's site for explaining plagiarism (and useful advice for improving your writing) (http://www-personal.umich.edu/~sdcamp/up540/writingtips.html).
- Pamphlet on avoiding plagiarism from UC-Davis: http://sja.ucdavis.edu/files/plagiarism.pdf
- Pamphlet on unacceptable paraphrases from Indiana University Writing Tutorial Services https://wts.indiana.edu/writing-guides/plagiarism.html
- Advice on how to use proper formats for citations and bibliographies: https://owl.purdue.edu/owl/research_and_citation/resources.html

Diversity, Equity, and Inclusion (DEI)
We follow the DEI statements established by SEAS, Taubman College of Architecture and Urban Planning and the School of Public Health, noted below.

"Taubman College affirms the principles of diversity, equity, and inclusion as we organize resources and priorities that align with our values. We seek to have a diverse group of persons at all levels of the college - students, faculty, staff and administrators - including persons of different race and ethnicity, national origin, gender and gender expression, socioeconomic status, sexual orientation, religious commitment, age, and disability status. We strive to create a community of mutual respect and trust, a community in which all persons and their respective backgrounds, identities, and views are allowed to be made visible and communicated without the threat of bias, harassment, intimidation, or discrimination."

In the spirit of increasing a sense of inclusion, consider following Taubman College's Phonetic Name Initiative (PNI) in the way you display your pronunciation and pronouns on your Zoom name and the name plates we ask you to bring to class.

"The University of Michigan School of Public Health (SPH) seeks to create and disseminate knowledge with the aim of preventing disease and promoting the health of populations worldwide. We recognize the histories of social discrimination globally, and seek to promote and extend opportunities for members of all groups that historically have been marginalized. We commit to developing the institutional mechanisms and norms necessary to promote the values of diversity, equity, and inclusion, both inside and outside our classrooms. To this end, SPH upholds the expectations that all courses will (1) **be inclusive**, (2) **promote brave discussions**, (3) **follow multicultural ground rules** and (4) **abide by UM policies and procedures**.

1) ***Inclusive courses***, are those in which teachers and learners co-create and co-sustain environments that support and encourage all members to participate equitably. See

http://crlt.umich.edu/multicultural-teaching/inclusive-teaching-strategies for more resources.

2) ***Brave*** (rather than safe) discussions promote diversity and social justice learning by acknowledging dynamics of oppression and privilege both inside and outside the classroom. Read more at http://ssw.umich.edu/sites/default/files/documents/events/colc/from-safe-spaces-to-brave-spaces.pdf.
3) ***Multicultural ground rules*** acknowledge diverse experiences in the classroom and offer strategies for holding one another appropriately accountable. See examples from the UM Program on Intergroup Relations and others at http://ncdd.org/rc/item/1505.
4) ***UM policies and procedures*** can be found at http://diversity.umich.edu with additional resources and instructions for reporting discrimination at https://sph.umich.edu/diversity-equity-inclusion/resources.html."

COVID-19 considerations

For the safety of all students, faculty, and staff on campus, it is important for everyone to comply with safety measures that have been put in place for our protection. We each have a responsibility for protecting the collective health of our community. Your participation in this course on an in-person basis is conditional upon your adherence to all safety measures mandated by the State of Michigan and the University. Face coverings are required indoors to start the semester. Vaccines are required, with limited exemptions, for students, faculty, and staff. Please do not eat in class, though you may drink beverages.

Students who are feeling ill should not come to class in-person. Students' grades will not be negatively impacted by not attending class due to illness. If you have caregiving responsibilities that will not allow you to attend certain classes, please contact the instructors to discuss options for engaging with missed class content.

Individuals seeking to request an accommodation related to the face covering requirement under the Americans with Disabilities Act should contact the Office for Institutional Equity.

Readings

No textbook is required for this course. All readings are provided under the "Files" tab of the course Canvas site. **Readings in bold typeface are required.** Those in regular typeface are recommended, but not required. These readings are subject to change. Please pay close attention to underlined notes that often indicate that you are only required to read a portion of the article.

Week	Date	Topic & Readings
UNIT I: INTRODUCTION TO SYSTEMS THINKING, SUSTAINABILITY AND THE GLOBAL FOOD SYSTEM		
1	August 31	Course introduction
	September 2	Interdisciplinarity and systems thinking • **Capra, F. 1985. Criteria for systems thinking. Futures. October, pg. 475-478.** • **Eigenbrode, S.D. et al. 2007. Employing philosophical dialogue in collaborative science. BioScience 57(1): 55-64.** • **Thorsøe, M., H. Alrøe, and E. Noe. 2014. Observing the observers: uncovering the role of values in research assessments of organic food systems. Ecology and Society 19: 46-51.** • Lélé, S. and R. B. Norgaard. 2005. Practicing interdisciplinarity. Bioscience, 55(11), 967–975. • Capra, F. 1994. From the parts to the whole: Systems thinking in ecology and education. Elmwood Quarterly. Summer/Fall-35-41
2	September 7	Food systems history • **Roberts, W. 2008. *The No-Nonsense Guide to World Food*. Chapter 2, "Brave new food"** • **McMichael, P. 2009. A food regime genealogy. *Journal of Peasant Studies*,36(1):139-169. ONLY pages 139-154** (the rest is optional). • Friedmann, H. 2000. What on Earth is the Modern World-System? Foodgetting and Territory in the Modern Era and Beyond, *Journal of World-Systems Research*, 2: 480-515. • Friedmann H, McMichael P. Agriculture and the state system: The rise and decline of national agricultures, 1870 to the present. Sociologia Ruralis 1989;(2):93-114.
	September 9	Food systems career and innovations panel (virtual)
UNIT II: FARMING SYSTEMS AND THE ENVIRONMENT		
3	September 14	The ecosystem concept and management paradigms • **Matson, P. A., Parton, W. J., Power, A. G. and Swift, M. J. 1997. Agricultural intensification and ecosystem properties. Science 277: 504–509.** • **Shennan, C. 2008. Biotic interactions, ecological knowledge and agriculture. Philosophical Transactions of the Royal Society B-Biological Sciences. ONLY Sections 1, 2, and 3 (pages 717-718).** • **Wezel, A., Herren, B. G., Kerr, R. B., Barrios, E., Gonçalves, A. L. R. and Sinclair, F. 2020. Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review. Agronomy for Sustainable Development 40: 1-13.** • Nicholls, C.I., Altieri, M.A. and Vazquez, L. 2017. Agroecological principles for the conversion of farming systems. Pages 1-16 *in* A. Wezel, editor. Agroecological Practices for Sustainable Agriculture. World Scientific, London, UK. • Odum, E.P. 1984. Properties of agroecosystems. In: Lowrance, R. et al. (Eds). Agricultural Ecosystems: Unifying Concepts, 5-12. • Tomich, T.P. et al. 2011. Agroecology: A review from a global change perspective. Annual Review of Environment and Resources 36:193-222. • SOCLA. Agroecology: concepts, principles, and applications. Contributions to the FAO's International Symposium on Agroecology for Food Security and Nutrition. • Robertson, G., K. Gross, S. Hamilton, D. Landis, T. Schmidt, S. Snapp, and S. Swinton. 2014. Farming for ecosystem services: An ecological approach to production agriculture. BioScience: biu037.

UNIT II: FARMING SYSTEMS AND THE ENVIRONMENT		
3	September 16	Nutrient cycles and soil fertility • **Drinkwater, L. E. et al. 2008. Ecologically-based nutrient management. *In:* Agricultural Systems: Agroecology and Rural Innovation for Development. Snapp, S. and B. Pound, Eds. ONLY pages 161-170.** • **Magdoff, F. and H. van Es. 2000. Building Soils for Better Crops. SARE. ONLY Chapters 2 & 5.** • Magdoff, F. and H. van Es. 2000. Building Soils for Better Crops. SARE. Chapters 3, 4, 6, 7, 10-12, 20. • Blesh J. 2019. Feedbacks between nitrogen fixation and soil organic matter increase ecosystem functions in diversified agroecosystems. Ecological Applications 29: e01986. • Vanek, S. and L.E. Drinkwater. 2013. Environmental, social, and management drivers of soil nutrient mass balances in an extensive Andean cropping system. Ecosystems, 16: 1517-1535. • Marriott EE, Wander MM. 2006. Total and labile soil organic matter in organic and conventional farming systems. Soil Science Society of America Journal, 70: 950-959. • McNear Jr., D.H. 2013. The rhizosphere—roots, soil, and everything in between. Nature Education Knowledge 4(3).
4	September 21	Biodiversity and agroecosystem function • **Shennan, C. 2008. Biotic interactions, ecological knowledge and agriculture. Philosophical Transactions of the Royal Society B-Biological Sciences. ONLY Sections 4 and 5 (pages 718-721).** • **Wood, S. A., D. S. Karp, F. DeClerck, C. Kremen, S. Naeem, and C. A. Palm. 2015. Functional traits in agriculture: agrobiodiversity and ecosystem services. Trends in Ecology & Evolution 30:531-539.** • Isbell, F., P. R. Adler, N. Eisenhauer, D. Fornara, K. Kimmel, C. Kremen, D. K. Letourneau, M. Liebman, H. W. Polley, and S. Quijas. 2017. Benefits of increasing plant diversity in sustainable agroecosystems. Journal of Ecology 105:871-879. • Blesh J. 2018. Functional traits in cover crop mixtures: biological nitrogen fixation and multifunctionality. Journal of Applied Ecology 55:38-48. • Jackson, L. E. et al. 2007. Utilizing and conserving agrobiodiversity in agricultural landscapes. Agriculture Ecosystems & Environment, 121:196-210. • Kremen, C., and A. Miles. 2012. Ecosystem services in biologically diversified versus conventional farming systems: benefits, externalities, and trade-offs. Ecology and Society 17. • Fischer J, Abson DJ, Bergsten A, Collier NF, Dorresteijn I, Hanspach J, Hylander K, Schultner J, Senbeta F. 2017. Reframing the food–biodiversity challenge. Trends in Ecology & Evolution 32: 335-345. • Tamburini G, Bommarco R, Wanger TC, Kremen C, van der Heijden MG, Liebman M, Hallin S. 2020. Agricultural diversification promotes multiple ecosystem services without compromising yield. Science Advances 6: eaba1715.

	September 23	Agriculture and climate change • **Eagle, A., L. Olander, L.R. Henry, K. Haugen-Kozyra, N. Millar, and G.P. Robertson. 2012. *Greenhouse Gas Mitigation Potential of Agricultural Land Management in the United States: A Synthesis of the Literature*. Report NI R 10-04, Third Edition. Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University. ONLY pages 1-21.** • USGCRP- Climate Change Impacts on U.S. Agriculture. • Kaye, J. P., and M. Quemada. 2017. Using cover crops to mitigate and adapt to climate change. A review. Agronomy for Sustainable Development 37:4. • Hatfield, J. L., K. J. Boote, B. Kimball, L. Ziska, R. C. Izaurralde, D. Ort, A. M. Thomson, & D. Wolfe. 2011. Climate impacts on agriculture: implications for crop production. *Agronomy Journal* 103:351-370. • Lin, B. B., M. J. Chappell, J. Vandermeer, G. Smith, E. Quintero, R. Bezner Kerr, D. M. Griffith, S. Ketcham, S. C. Latta, and P. McMichael. 2011. Effects of industrial agriculture on climate change and the mitigation potential of small-scale agroecological farms. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources 6:1-18. • Clark M.A., N.G. Domingo, K. Colgan, S.K. Thakrar, D. Tilman, J. Lynch, I.L. Azevedo, and J.D. Hill. 2020. Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets. Science 370:705-708.
5	September 28	Unit II case study: Nutrient pollution from the Mississippi River Basin and Gulf Hypoxia • **Required reading: Case Study Summary** • Blesh, J., and R. E. Galt. 2017. Transitions to agroecological nutrient management practices in the USA Corn Belt. Pages 85-126 *in* A. Wezel, editor. Agroecological Practices for Sustainable Agriculture. World Scientific, London, UK. • Blesh, J. and L.E. Drinkwater. 2013. The impact of nitrogen source and crop rotation on nitrogen mass balances in the Mississippi River Basin. Ecological Applications, 23(5):1017-1035. • David, M.B., Drinkwater, L. E. and G.F. McIsaac. 2010. Sources of nitrate yields in the Mississippi River Basin. Journal of Environmental Quality, 39:1657-1667.
	September 30	Introduction to problem-based learning research projects; problem-based learning in-class activity I (virtual)
UNIT III: SUSTAINABLE FOOD SYSTEMS AND HEALTHY DIETS		
6	October 5	Sustainable food systems and healthy diets: Key issues • **Global Panel on Agriculture and Food Systems for Nutrition. Food systems and diets: Facing the challenges of the 21st century. London, UK: Global Panel on Agriculture and Food Systems for Nutrition, 2016. ONLY Chapter 6.** • **Hawkes C, Friel S, Lobstein T, Lang T. Linking agricultural policies with obesity and noncommunicable diseases: A new perspective for a globalising world. Food Policy 2012; 37:343-353.** • Whitmee S, Haines A, Beyrer C, Boltz F, Capon AG, de Souza Dias BF, et al. Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation-Lancet Commission on planetary health. Lancet 2015;386:1973-2028. • Hawkes C, Jewell J, and Allen K. A food policy package for healthy diets and the prevention of obesity and diet-related non-communicable diseases: the NOURISHING framework. Obesity Reviews 2013;14:159-68.
	October 7	Sustainable diets • **Willett W, Rockstrom J, Loken B, Springmann M, Lang T, Vermeulen S, Garnett T, Tilman D, DeClerk F, Wood A, Jonell M, Clark M, et al. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet 2019;393:447-92. READ ONLY Section 3 (pp. 470-476).** • **Garnett T. What is a sustainable healthy diet? Discussion Paper. Food Climate Research Network, 2014.** • Rose D, Heller MC, Willits-Smith AM, Meyer RJ. Carbon footprint of self-selected US diets: nutritional, demographic, and behavioral correlates. American Journal of Clinical Nutrition 2019;109(3):526-534.

		• Tilman D, Clark M. Global diets link environmental sustainability and human health. Nature 2014; 515:518-521. • Peters CJ, Picardy J, Darrouzet-Nardi AF, Wilkins JL, Griffin TS, Fick GW. Carrying capacity of US agricultural land: Ten diet scenarios. Elementa: Science of the Anthropocene 2016;4. • Gustafson D, Gutman A, Leet W, Drewnowski A, Fanzo J, Ingram J. Seven Food System Metrics of Sustainable Nutrition Security. Sustainability 2016;8(196): doi:10.3390/su8030196. • Jones AD, Hoey L, Blesh J, Miller L, Green A, Fink Shapiro L. A Systematic Review of the Measurement of Sustainable Diets. Advances in Nutrition 2016; 7:641–64. • Heller MC, Keoleian GA, Willett WC. Toward a life cycle-based, diet-level framework for food environmental impact and nutritional quality assessment: a critical review. Environmental Science & Technology 2013;47(22):12632-47. • Hawkins I, Sabaté J. Defining "sustainable" and "healthy" diets in an era of great environmental concern and increased prevalence of chronic diseases. American Journal of Clinical Nutrition 2013;97(5):1151-2.
7	October 12	Agrobiodiversity and healthy diets • **Bioversity International. Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index. Bioversity International, Rome, Italy, 2017. <u>ONLY Chapter 2 (pp. 24-45).</u>** • Jones AD. Agricultural biodiversity and diet quality in low- and middle-income countries: a critical review of the emerging research evidence. Nutrition Reviews 2017. doi: 10.1093/nutrit/nux040. • Sibhatu KT, Krishna VV, Qaim M. Production diversity and dietary diversity in smallholder farm households. Proceedings of the National Academy of Sciences 2015: www.pnas.org/cgi/doi/10.1073/pnas.1510982112. • Powell B, Thilsted SH, Ickowitz, Termote C, Sunderland T, Herforth A. Improving diets with wild and cultivated biodiversity from across the landscape. Food Security 2015;7:535-554. • Remans R, Fanzo J, Palm CA, DeClerck F. "Ecology and Human Nutrition". In: Integrating Ecology and Poverty Reduction (Carter Ingram J, DeClerk F, Rumbaitis del Rio C, eds.), pp. 53-76. New York: Springer, 2012.
	October 14	Lecture: TBD
8	October 19	**FALL STUDY BREAK: NO CLASSES**
	October 21	Unit III debate: TBD
9	October 26	Guest speaker (virtual): TBD
	October 28	Problem-based learning in-class activity II (virtual)
UNIT IV: FOOD POLICY & PLANNING		
10	November 2	National US food system policies • **Barnett, B. 2014. The last farm bill? *Journal of Agricultural and Applied Economics*, 46(3): 311-319.** • **Johnson, R. & J. Monke. 2018. What is the Farm Bill? Washington DC: Congressional Research Service. [Only pages 8 to 13 are required reading – especially focus on the Title(s) you are assigned]** • Alston, J., Sumner, D., and S. Vosti. 2008. Farm subsidies and obesity in the United States: National evidence and international comparisons. *Food Policy*, 33: 470-479. • Hassanein, N. 2011. Matters of scale and the politics of the Food Safety Modernization Act. *Agriculture and Human Values,* 28: 577-581. • Imhoff, D. 2012. *Food Fight: The Citizen's Guide to the Next Food and Farm Bill.* Healkberg, CA: Watershed Media
	November 4	Regional and local food systems planning • **Vitiello, D. and C. Brinkley. 2013. The hidden history of food system planning. *JPH*, 13(2): 91-112.** • **Born, B. and Purcell, M. 2006. Avoid the local trap: Scale and food systems in planning research. *Journal of Planning Education and Research,* 26. Pp 195-205** • Peters CJ, Bills NL, Lembo AJ, Wilkins JL, and Fick GW. 2012. Mapping potential foodsheds in New York State by food group: An approach for prioritizing which foods to grow locally. *Renewable Agriculture and Food Systems* 27(2): 125-137.

		• Pothukuchi, K. 2009. Community and regional food planning: Building institutional support in the United States. *International Planning Studies*, 14(4): 349-367.
11	November 9	Urban agriculture and food environments • **Shannon, J. 2014. Food deserts: Governing obesity in the neoliberal city. *Progress in Human Geography*, 38(2): 248-266.** • **Horst, M., McClintock, N. and L. Hoey. 2017. The Intersection of Planning, Urban Agriculture, and Food Justice: A Review of the Literature. *Journal of the American Planning Asscn*, 83:3, 277-295.** • Freeman, A. 2007. Fast food: Oppression through poor nutrition. *California Law Review*, 95(6). • Walker, R., Keane, C. and J. Burke. 2010. Disparities and access to healthy food in the United States: A review of food deserts literature. *Health and Place*, 16: 876-884 • Zezza, A. and L. Tasciotti. 2010. Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food Policy*, 35, 265-273. • Zeeuw, H. and P. Drechse (Eds). 2015. Chatpers 1 and 2 in *Cities and Agriculture - Developing Resilient Urban Food Systems*. Leusden, The Netherlands: RUAF (Resource Centre on Urban Agriculture and Forestry): http://www.ruaf.org/publications/cities-and-agriculture-developing-resilient-urban-food-systems
	November 11	Policy advocacy and social movements • **Holt-Gimenez, E. and A. Shattuck. 2011. Food crises, food regimes and food movements: rumblings of reform or tides of transformation? *The Journal of Peasant Studies*, 38:1, 109-144** • Allen, P. and Sachs, C. 2007. Women and Food Chains: The Gendered Politics of Food. *International Journal of Sociology of Agriculture and Food* 15(1):1023. *Pp 1-16.* • Beuchelt, T., and D. Virchow. 2012. Food sovereignty or the human right to adequate food: Which concept serves better as international development policy for global hunger and poverty reduction? *Agriculture and Human Values*, 29: 259-273 • Campbell, L. 2016. Getting farming on the agenda: Planning, policymaking, and governance practices of urban agriculture in New York City. *Urban Forestry and Urban Greening,* 19: 295-305. • Hart A., McMichael, P., J. Milder, and S. Scherr. 2016. Multi-functional landscapes from the grassroots? The role of rural producer movements. *Agriculture and Human Values*, 33:305–322 • Hassanein, N. 2003. Food democracy: A pragmatic politics of transformation. *J Rural Studies*, 9: 77-86 • Hoey, L. and A. Sponseller. 2018. "It's hard to be strategic when your hair is on fire": Alternative food movement leaders' motivation and capacity to act. *Agriculture & Human Values,* 35(3), 595-609. • Jayaraman, S. 2013. *Behind the Kitchen Door*. Ithaca, NY: Cornell U Press. BOOK – not on Canvas • Pelletier, D, Frongillo, EA, Gervais, SG, Hoey, L, Menon , P, Ngo, T, Stoltzfus, RJ, Shamsir Ahmed, AM., Ahmed, T. 2011. Nutrition agenda setting, policy formulation and implementation: Lessons from the Mainstreaming Nutrition Initiative. *Health Policy and Planning,* (Feb 3): 1-13 • Raja, S., Picard, D., Baek, S., & Delgado, C. 2014. Rustbelt radicalism: A decade of food systems planning in Buffalo, New York (USA). *Journal of Agriculture, Food Systems, and Community Development*, 4(4), 173–189. • Reynolds, K. and N. Cohen. 2016. Chapter 5: Cultivating policy, pp. 74-93. *Beyond the Kale: Urban Agriculture and Social Justice Activism in New York City.* Athens, GA: University of GA Press.
12	November 16	Problem-based learning in-class activity III (virtual)
UNIT V: GLOBAL SYNTHESIS, STUDENT PRESENTATIONS AND WRAP-UP		
12	November 18	Unit IV case study: TBD
13	November 23	Food systems & COVID-19 integrated lecture
	November 25	**THANKSGIVING: NO CLASSES**
14	November 30	Student presentations

	December 2	Student presentations
15	December 7	Student presentations
	December 9	Global synthesis lecture and discussion; course wrap-up • **Fraser, E., A. Legwegoh, K. Krishna, M. CoDyre, G. Dias, S. Hazen, R. Johnson, R. Martin, L. Ohberg, and S. Sethuratnam. 2016. Biotechnology or organic? Extensive or intensive? Global or local? A critical review of potential pathways to resolve the global food crisis. Trends in Food Science & Technology 48: 78-87.** • **Wittman, H., M. J. Chappell, D. J. Abson, R. Bezner Kerr, J. Blesh, J. Hanspach, I. Perfecto, and J. Fischer. 2017. A social-ecological perspective on harmonizing food security and biodiversity conservation. Regional Environmental Change 17:1291-1301.** • **Meadows, D. 1998. Indicators and information systems for sustainable development. The Sustainability Institute. Chapters 1-4, pages 1-21.** • Cabell, J. F., and M. Oelofse. 2012. An indicator framework for assessing agroecosystem resilience. Ecology and Society 17. • Walsh-Dilley, M., W. Wolford, and J. McCarthy. 2016. Rights for resilience: food sovereignty, power, and resilience in development practice. Ecology and Society 21. • Lopez-Ridaura, S., Masera, O., and M. Astier. 2002. Evaluating the sustainability of complex socio-environmental systems. The MESMIS framework. Ecological Indicators 2: 135-148. • Schipanski, M.E., MacDonald, G.K., Rosenzweig, S., Chappell, M.J., Bennett, E.M., Bezner-Kerr, R., Blesh, J., Crews, T., Drinkwater, L.E., Lundgren, J., and C. Schnarr. 2016. Realizing resilient food systems. *BioScience*. doi:10.1093/biosci/biw052. • Explore: http://www.sustainablemeasures.com/indicators