



Course Syllabus, Jan 2020

ISEN 471 – Sustainable Food - **DRAFT**

Northwestern University

Instructor:

Anthony Kingsley, MA, MSc

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Office Hours: **TBD** – possibly Monday 5-6pm

NU Faculty Sponsor:

Nyree Zerega (WCAS)

<https://www.plantbiology.northwestern.edu/people/faculty/nyree-zerega.html>

Class Room: **TBD**

Class Timing: Monday, 6-9pm (Spring 2020, First 5 weeks of quarter)

Course Synopsis: This class will cover the main sustainability topics related to the production, transportation, processing and consumption of food. It will focus on tangible methods to promote sustainability in the food industry such as regenerative agriculture techniques, reducing GHG emissions throughout the supply chain and reduced food waste. It will provide a broad overview of the economic, technological and policy considerations in implementing sustainable food solutions.

Course Goals: Students will develop a broad foundation in:

- **Consumer-Oriented Analysis:** Students will be able to analyze food waste issues from the perspective of end consumers. They will use behavioral data to understand the role of consumers in promoting sustainable food. Including a discussion on consumer trends and how 3rd party certifications play a role in consumer choice.
- **Agricultural Methods:** Students will learn about different agricultural methods such as organic agricultural practices, multistrata agroforestry, silvopasture, intercropping, indoor growing, etc. to understand the opportunity for agricultural change in promoting food sustainability.
- **Processing Methods & Packaging:** Students will learn about the various methods of food processing and analyze their environmental impacts. They will evaluate various sustainable processing solutions, and how packaging impacts sustainability.
- **Policy Considerations:** Students will learn about the various incentives, stakeholders and policy-makers involved in sustainable food through the help of cases.
- **Environmental Impact Analysis:** Using metrics such as GHG intensity, students will apply their ability to analyze environmental impact to the food industry, assessing the environmental

pros and cons of solutions Students will also apply standard financial cost-benefit analyses to the food industry.

- **Distribution and Transportation:** Along with a focus on production/processing and the end consumer, students will also go over food distribution as an environmental challenge. This will apply concepts from transportation sustainability, traceability, etc. to the food industry.

This course will require some technical and quantitative competency but in general there are no prerequisites. As many students will not have deep knowledge of food systems and sustainability topics, the reading list is significant. Students are expected to complete readings prior to class. Please refer to the reading list for primary texts that will be used for the class. There will also be supplemental readings, including articles and essays, that will be provided by the instructor.

As part of the class, we will have a series of guest panels and lectures by business professionals from a variety of stakeholders that work in the sustainability field. Particular focus will be placed on the practical reality of how to assess and implement solutions in the food industry.

Grading/Assessment:

Grading will be based on the following rubric:

Component	Weight	Details	Due
Case Write Ups	60%	Three 2-3 page write ups on key questions from case studies. Students will submit their write-ups before the class discussion session. Late assignments will be accepted with extenuating circumstances.	Week #2, #3, #4
Final Case	25%	Final paper (~8-10 pages) that includes an analysis of a particular food industry. For example, a student may choose to analyze the beef jerky industry. The student would have to consider practical measures the industry could implement in order to promote sustainability, analyzing the consumer-end, distribution and basic production/processing. Alongside this, the student would have to consider the financial and environmental cost-benefits of their solutions. This incorporates most of the analytical tools used in class. Although the paper is due at the end of week 5, students must have spoken to	Week #5, intermediate deadline at Week #4



		their instructor and selected an industry to focus on by the end of week 4.	
Preparation, Participation and Effort	15%	Based on attendance and instructor assessment of preparation and participation in class on a weekly basis. There may be unannounced quizzes on the readings which students should be prepared for.	Ongoing

Grading Policy: Grades will be assigned based on all the work you have completed during the semester following the traditional practice of A=90-100, B=80-89, C=70-79, D=60-69, F<60.

CLASS OUTLINE *(subject to change)*

Weekly Topic	Description
<p>1: Introduction to Food Systems (Production and Distribution)</p> <p>Environmental Impact Analysis and the Context of Food within Climate Change</p>	<ul style="list-style-type: none"> • This module will have a technological focus. It will discuss the current agricultural methods of food production, and their environmental impacts. • It will discuss the current methods of food processing with their impacts. • Briefly touch on distribution/transportation as a general concern, but not a main focus. • It will discuss consumer choice as a method of reducing food waste and in promoting dietary change. • Discuss where food fits in to the global conversation of climate change
<p>2: Introduction to Food Systems (Consumers)</p> <p>Agricultural Practices</p> <p>Explore conventional growing and food safety, explore organic, GMO, waste in the field, soil health, worker safety. Understand the economics of the various methods.</p>	<ul style="list-style-type: none"> • Focus on sustainable food production solutions such as silvopasture, intercropping, regenerative agriculture etc. • This module will have a policy/economic focus -- examples of how policy can impact food production (e.g. ethanol subsidies, GMO, Animal Care, etc) • Will also consider food waste from a production standpoint, and biomass on the farm



	<p><i>CASE STUDY A: Silvopasture in Colombia, and Regenerative Agriculture by General Mills case study both Ranked by Project Drawdown as #9 and #11 solutions to combat climate change. In your opinion, are these approaches feasible environmentally and financially? Discuss the different approaches and support your argument with evidence from the case study, and from outside sources if necessary.</i></p>
<p>3: Sustainability in Food Systems</p> <p>Processing Methods and Packaging</p>	<ul style="list-style-type: none"> • Continue the conversation on sustainable agricultural practices, and efficiency -- Sustainable Seafood practices and indoor/urban growing • This week will focus on the most impactful, practical solutions in production, distribution and consumptions • It will iterate through the parts of the food system, proposing solutions to the problems in production/ processing, distribution and consumption • Consider how packaging reduces food waste, how compostable packaging is impacting the industry – impact on Chinese restriction on accepting waste, and how food is used to create packaging • Light touch on how plastic is impacting the environment • Discuss Food waste from a systems level, the importance of composting and its barriers <p><i>CASE STUDY B: Policy and legislation as a tool for sustainable food: French government regulation (1) (2) to decrease food wastage on the retail front, or the Good Samaritan Act of 1996. In your opinion, is such legislation effective in addressing sustainable food systems? Discuss and support your argument with evidence from the case study, and from outside sources if necessary.</i></p>
<p>4: Sustainable Solutions in Food Systems</p> <p>Local Food systems, transparency, technology, and consumer perceptions</p>	<ul style="list-style-type: none"> • What are the policy considerations for the implementation of the last 4 weeks? How can they be financed? Who are the concerned stakeholders? • Review local food systems and how they aid or create challenges to sustainability – impact on communities; environmental justice • Traceability and transparency in the food system – how does Blockchain or traceability platforms improve or



	<p>enable and promote sustainable solutions for the food system</p> <ul style="list-style-type: none"> • Mention of distribution and inherent challenges of how product is delivered through technology advancement in transportation – Tesla Electric Truck, Alternative Fuels, Refrigeration, etc. • Begin discussion on sustainable food trends in retail and foodservice <p><i>CASE STUDY C: Analyze the business models and effectiveness of a company that rescues and sells ‘ugly produce’ such as: Imperfect Foods, (Produce Specifications) or Intermarche.</i></p> <p><i>Based on your assessment, do these models have positive externalities or are these standard profit-based models? Discuss and support your argument with evidence from the case study, and from outside sources if necessary.</i></p> <p>Select case for final submission by first class of week.</p>
<p>5: Impact Analysis of Sustainable Food</p> <p>GHG emissions assessments, greenwashing, and class wrap-up</p>	<ul style="list-style-type: none"> • This week will focus on impact analysis for solutions. It will assess environmental and financial impacts using metrics such as GHG intensity. • Consider how the consumer or diner views sustainability on the plate or in the store – what are the underlying motivations to purchase sustainable food; how does cost impact choice? • How does communication and greenwashing impact food companies and consumers – how 3rd party certifications promote trust and understanding • Impact analysis will be linked to incentives—this module will discuss how incentives can be effectively used to promote change. <p>Final Case Due</p> <p><i>Bring in examples of sustainable food products – assess viability of products (ask the class for any severe allergies)</i></p>

There will be no final exam for this class, but final case will be due on scheduled final exam date.

Course Readings:

**Week 1**

Required readings:

- Hoey, L. and Sponseller, A. 2018. It's hard to be strategic when your hair is on fire. *Agriculture & Human Values*, 35(3), p.595-609
- Stephen R. Gliessman, "The agroecosystem concept," pp. 23-34 in *Agroecology*
- Vitiello, D. and C. Brinkley. 2013. The hidden history of food system planning. *Journal of Planning History*, 13(2): 91-112
- Friedmann H, McMichael P. 1989. Agriculture and the state system: The rise and decline of national agricultures, 1870 to the present. *Sociologia Ruralis* (2):93-114.

Case Study:

- *No case study assignment*

Week 2

Required readings:

- 2019, Farm bill 101, <https://www.farmaid.org/issues/farm-policy/farm-bill-101/>
- Kuepper, G. 2010. A brief overview of the history and philosophy of organic agriculture. Kerr Center for Sustainable Agriculture. P 11-18
- IPCC. 2019. Special Report on Climate Change and Land, Summary for Policy Makers, Section A-B. <https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/>
- Stephanie Strom. 2012. Has 'organic' been oversized?. in *New York Times*

Case Study:

- Palmer, Lisa. 2014. In the Pastures of Colombia, Cows, Crops and Timber Coexist. *Yale 360 online*
- Rosenzweig, W. 2019. General Mills: Driving Food Systems Change through Regenerative Agriculture. Berkeley Haas Case Study Series

Week 3

Required readings:

- Lagomarsino, V. 2019. Hydroponics: The Power of Water to Grow Food. <http://sitn.hms.harvard.edu/flash/2019/hydroponics-the-power-of-water-to-grow-food/>
- Environmental Protection Agency, Food Recovery Hierarchy. <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>
- Royte, E. 2016. How Ugly Fruit and Vegetables can help Solve World Hunger. In *National Geographic Magazine online*
- Schanes, K. 2018. Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production* 182 p. 978-991

Case Study:

- Haley, J. 1996. The Legal Guide to the Bill Emerson Good Samaritan Food Donation Act. <http://media.law.uark.edu/arklawnotes/2013/08/08/the-legal-guide-to-the-bill-emerson-good-samaritan-food-donation-act/>
- French Food Waste & Donation Case Study: <https://www.pbs.org/newshour/show/is-frances-groundbreaking-food-waste-law-working>

Week 4

Required readings:

- Anupindi, R. 2019. Michigan Dining: 20% Local by 2025. University of Michigan
- Born, B. and Purcell, M. 2006. Avoid the local trap: Scale and food systems in planning research. *Journal of Planning Education and Research*, 26 p.195-205
- K.G. Grunert et al. 2014. Sustainability Labels on Food Products. *Food Policy* 44 p.177–189
- Heller, M. and Keoleian G. 2014. Greenhouse Gas Emission Estimates of U.S. Dietary Choices and Food Loss. *Journal of Industrial Ecology*

Case Study:

- Imperfect Produce
- Produce Specifications

Week 5

Required readings:

- Craig, Sheffi, Blanco. A Supply Chain View of Product Carbon Footprints: Results from the Banana Supply Chain
- The Insatiable Appetite Podcast. The Hartman Group. 'Why Product Narrative Matters.' May 17, 2019
- Pothukuchi, K. 2009. Community and regional food planning: Building institutional support in the United States. *International Planning Studies*, 14(4): 349-367.
- Grace, C. 2007. Barriers to using urban farmers markets. *Journal of Hunger and Environmental Nutrition* 2:1
- Block, D. et al. 2012. Food Sovereignty, Urban Food Access and Food Activism: Contemplating Connections through Examples from Chicago. *Agricultural Human Values*.

Case Study:

- *No case study assignment*

Additional readings:

- Berry, W. 2001. The idea of a local economy. *Orion Magazine*
- Conkin, P. Agriculture and the environment. p.168-173 in *A Revolution Down on the Farm*
- Altieri, Miguel et al. 2011. The Agroecological Revolution in Latin America: Rescuing Nature, Ensuring Food Sovereignty and Empowering Peasants. *Journal of Peasant Studies* 38 (3) (July): p.587–612.
- Jackson, L. et al. 2010. Biodiversity and Agricultural Sustainability: From Assessment to Adaptive Management. *Current Opinion in Environmental Sustainability* 2 (1-2)
- Holt-Giménez, Eric. 2002. Measuring Farmers' Agroecological Resistance After Hurricane Mitch in Nicaragua. *Agriculture, Ecosystems & Environment* 93 (1-3) (December): 87–105
- Leach, Melissa, James Fairhead, and James Fraser. 2012. "Green Grabs and Biochar: Revaluing African Soils and Farming in the New Carbon Economy." *Journal of Peasant Studies* 39 (2)(April): 285–307.

- U.S. Department of Agriculture, Know Your Farmers, Know Your Compass: The what and why of local and regional foods, p.5-16
- Carolan, Michael. 2006. Science, expertise, and the democratization of the decision-making process. *Society & Natural Resources* 19:7
- Dunn, Robert. 2017. Never Out of Season: How having the food we want when we want it threatens our food supply and our future
- Kuepper, G. 2010. A brief overview of the history and philosophy of organic agriculture. Kerr Center for Sustainable Agriculture
- Drinkwater, L. E. et al. 2008. Ecologically-based nutrient management. In: *Agricultural Systems: Agroecology and Rural Innovation for Development*.
- Magdoff, F. and H. van Es. 2000. Building Soils for Better Crops. SARE
- Wenonah Hauter. Organic food: The paradox. p.98-115 in *Foodopoly*
- FTC Green Guidelines,
https://www.ftc.gov/sites/default/files/documents/federal_register_notices/guides-use-environmental-marketing-claims-green-guides/greenguidesfrn.pdf

Throughout the quarter, students will be required to view videos outside of class time. Videos are available online. Instructor may also assign a number of industry news services to discuss timely/current updates in markets design and regulation that are illustrative of core course topics.

“Waste: The story of food waste by Anthony Bourdain”

“The Biggest little Farm”

Northwestern University Policies & Resources:

Academic Integrity

Academic integrity is taken very seriously at Northwestern. Students are responsible for reading and understanding Northwestern’s Academic Integrity policies. All suspected violations will be reported to the McCormick College of Engineering’s Dean’s Office. These include: cheating, plagiarism, fabrication, unfair advantage, unauthorized collaboration, and aiding and abetting of academic dishonesty. Students found in violation of academic integrity may receive a zero on the assignment or a failing grade for the course, and may be suspended or permanently expelled from the University. See [Academic Integrity: A Basic Guide](#) for more information.

AccessibleNU and Disability Accommodations

Any student requesting accommodations related to a disability or any other condition is required to register with AccessibleNU (847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential. See the [AccessibleNU website](#) for more information.

**Illness and Medical Leave of Absence**

Review the University's [policy](#) on missing academic work due to illness. Your instructor cannot waive an assignment missed due to illness unless she can verify your illness with Health Services.

Discrimination and Sexual Harassment

Northwestern's Policies on Discrimination, Harassment, and Sexual Harassment apply to all members of the University community, including students, staff, faculty, and third parties. Any student, staff, faculty member, or third party who believes that they have been discriminated against or harassed on the basis of their race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, pregnancy, parental status, marital status, age, disability, citizenship, veteran status, genetic information or any other classification protected by law, should contact the Office of Equity at (847) 467-6571. Additional information about the University's discrimination and harassment policies, including the campus resources available to assist individuals with discrimination or harassment concerns, is available online on the [Office of Equity Website](#). Students, staff, and faculty who report harassment, discrimination, or sexual misconduct are also protected under the [University's Policy on Non-Retaliation](#).

Sexual Misconduct and Reporting

Northwestern University is committed to fostering an environment where students are safe and free from sexual misconduct. [Confidential resources](#) are available to those who have experienced sexual misconduct. Faculty and instructors are not confidential resources and are required to report incidents of sexual misconduct, whether discussed in your assignments or in person, to the Office of Equity, which can provide information about resources and options. We encourage students who have experienced sexual misconduct to talk with someone to get support. For more information, including how to request interim protective measures and academic accommodations or file a complaint, see the [Get Help page](#).

Other Resources

Students can find useful resources for safety and security, academic support, and mental and physical health and well-being at the [NUhelp website](#).