Course Syllabus
ISEN 471 Sustainable Food (0.5 credit)
Northwestern University

Instructors: Anthony Kingsley, Head of Sustainability, Impact & ESG, Benson Hill, anthony.kingsley@northwestern.edu

Bio: https://isen.northwestern.edu/anthony-kingsley

Guest Lecturers: TBD

Office Hours: By appointment

Class Assistant: TBD
Classroom: TBD
Class Timing: Fall Quarter

Course Synopsis:
This class will cover the main sustainability topics related to growing, commercializing, transporting and consuming sustainable 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 environmental considerations in implementing sustainable food solutions, with a focus on the private sector.

Course Goals: Students will develop a broad foundation in:

- **Agricultural Methods**: Students will learn about different agricultural methods such as organic or regenerative agricultural practices, silvopasture, intercropping, GMO, etc. to understand the opportunity for agricultural change in promoting food sustainability.

- **Food Waste, Processing & Packaging**: Students will learn about reduced waste product development and consolidation of the food industry – pros and cons – and the various methods to reduce food waste within processing and packaging.

- **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, block chain, etc. to the food industry.

- **Environmental Impact Analysis**: Using Life Cycle Assessments and supply chain mapping, students will apply their ability to analyze environmental impact to the food industry, assessing the environmental pros and cons of solutions, and also applying standard financial cost-benefit analyses.
**Consumer-Oriented Analysis:** Students will look at consumer trends to understand how companies are promoting sustainable food. Including a discussion on how 3rd-party certifications play a role in consumer choice.

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 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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Details</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Write Ups</td>
<td>60%</td>
<td><em>Three write-ups of 800-1200 words on key questions from case studies. Students will submit their write-ups before the class discussion session.</em></td>
<td>Week 2, 3, 4</td>
</tr>
<tr>
<td>Final Case</td>
<td>30%</td>
<td><em>Final paper of 3,000-3,5000 words that includes an analysis of a particular food industry. Focus on commercialization of a specific industry, for example, a student may choose to analyze the beef jerky industry. The students 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 their instructor and selected an industry to focus on by the end of week 4.</em></td>
<td>Week 5, intermediate deadline at Week 4</td>
</tr>
</tbody>
</table>
Preparation, Participation and Effort 10%  
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.

Grades will be assigned based on all the work you have completed during the quarter using the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Score</th>
<th>Maximum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93.333 to 100</td>
<td>73.333 to 76.666</td>
</tr>
<tr>
<td>A-</td>
<td>90.000 to 93.333</td>
<td>70.000 to 73.333</td>
</tr>
<tr>
<td>B+</td>
<td>86.666 to 90.000</td>
<td>66.666 to 70.000</td>
</tr>
<tr>
<td>B</td>
<td>83.333 to 86.666</td>
<td>63.333 to 66.666</td>
</tr>
<tr>
<td>B-</td>
<td>80.000 to 83.333</td>
<td>60.000 to 63.333</td>
</tr>
<tr>
<td>C+</td>
<td>76.666 to 80.000</td>
<td>&lt; 60.000</td>
</tr>
</tbody>
</table>

- It is expected that all work submitted for this class is the original work of the student submitting. All suspected violations will be reported to the McCormick College of Engineering’s Dean’s Office in accordance with the NU Academic Integrity Policy.
- Late assignments will be accepted with extenuating circumstances, you must receive approval from the instructor prior to the submission due date.

CLASS OUTLINE (subject to change)

<table>
<thead>
<tr>
<th>Session Topic</th>
<th>Description</th>
</tr>
</thead>
</table>
| 9/22: Introduction to Food Systems and Impacts of Sustainable Food | • This module will introduce the class to the current agricultural methods of food production, and their environmental impacts  
• Discuss how the industry and society define sustainable food, and how we’ve arrived at that definition |

Readings:
- FAO. 2018. Sustainable Food Systems: Concept and Framework. (Links to an external site.)  
- WEF. 2021. “What is agroecology – and how can it help us fight climate change?” (Links to an external site.)
**9/27: Intro Continued**

- Consider the complexities of the food system, discussing the various stakeholder groups to be aligned and engaged as well as high-level solutions proposed by these groups
- Discussion on mapping the food supply chain

**Readings:**
- Kaufman, Dan. *Is it time to break up Big Ag?*, The New Yorker. Aug 17, 2021. (Links to an external site.)

**9/29: Organic and GMOs**

- Explore current sustainable food production solutions – Organic, GMOs, and genomics
- This module will have a policy/economic focus – discussing how the organic and Non-GMO standards are created and how they are being defined
- Consider how consumers view Organic, Non-GMO, Regenerative Agriculture and motivation for purchasing and consumption

**Readings:**
- GMO... OMG, SCIENCE VS podcast. 2017. Gimlet Media. (Links to an external site.)
- Stephanie Strom. 2012. Has 'organic' been oversized. New York Times (Links to an external site.)

*CASE STUDY A:* Regenerative Agriculture is ranked by *Project Drawdown* (Links to an external site.) as a top 10 solution to combat climate change. In your opinion, how is regenerative agriculture different from USDA Organic? Is regen ag feasible environmentally and/or financially for businesses and...
farmers to implement? What are barriers and/or benefits of this approach? Discuss and support your position with evidence from the case studies, and from outside sources if necessary.


Purchase: [https://hbsp.harvard.edu/import/861941](https://hbsp.harvard.edu/import/861941) (Links to an external site.)

**Due Date: October 8, 2021 at 11:59pm**

| 10/4: Sustainable Agriculture | Discussion on farm conservation practices, aka. Regenerative ag., their impact on emissions, and the formation of carbon markets |

**Readings:**
- Fessler, Joe. Regenerative Agriculture Needs a Reckoning. The Counter. May 3, 2021 (Links to an external site.)
- Popkin, Gabriel. “Is Carbon sequestration on farms actually working to fight climate change?”, GreenBiz (Links to an external site.)
- [Video] Brown, Gabe. 2016. Regeneration of our Lands: A Producer’s Perspective. TEDx Grand Forks (Links to an external site.)

| 9: 10/6: Food Waste Issues and Commercialization | Guest Speaker: Turnery Wyatt, CEO of Upcycled Foods Association
- Discuss how food waste strategies are being commercialized
- Discuss the impact of legislative restrictions, and EPA’s approach to reduce food waste |

**Readings:**
- Jasmine Crowe, What Can We Do To Tackle Food Waste and Hunger? (Links to an external site.)
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/11:</td>
<td><strong>Food Waste in Production and Packaging</strong></td>
<td>Consider how packaging reduces food waste, how compostable packaging is impacting the industry. Discuss food waste from a systems level, talk through the value chain determining barriers and solutions to food waste – financial and social externalities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· FAO. <em>The State of Food and Agriculture 2019. Chapter 3, Reducing Food Loss and Waste – The Business Case and Beyond.</em> (Links to an external site.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· 2019. <em>Is France’s groundbreaking food-waste law working?</em> (Links to an external site.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Environmental Protection Agency, <em>Food Recovery Hierarchy.</em> (Links to an external site.)</td>
</tr>
<tr>
<td></td>
<td><strong>CASE STUDY B:</strong> Analyze the business models and effectiveness of a company that rescues and sells ‘ugly produce’ such as (Choose one): Imperfect Foods (Links to an external site.), Intermarche (Links to an external site.), or Bon Appetit (Links to an external site.). Based on your assessment, do these models have positive externalities in profit, environment and the community, or are these standard profit-based models? What are the criticisms and barrier for ‘waste’ based companies? Discuss and support your argument leveraging outside sources as necessary. Due Date: October 15, 2021 at 11:59pm</td>
<td></td>
</tr>
<tr>
<td>10/13:</td>
<td><strong>Technology and Traceability</strong></td>
<td>Guest Speaker: Mark Kaplan, Founding Partner, Envisible. Discuss traceability and transparency in the food system – consider current technology use and its financial, social, and environmental impacts. Discuss the complexities of distribution and inherent challenges of how product is delivered through technology advancement.</td>
</tr>
<tr>
<td></td>
<td><em>Guest Speaker</em></td>
<td></td>
</tr>
<tr>
<td>10/18:</td>
<td><strong>Local Foods and Product Narrative</strong></td>
<td>Discuss local food systems and discuss financial, environmental and social externalities. Consider how corporates and consumers view local foods and motivation for purchase and consumption.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Readings:

- Berry, W. 2001. The idea of a local economy. Orion Magazine
- Grunert, K. et al. 2014. Sustainability Labels on Food Products. Food Policy 44 p.177–189

**CASE STUDY C:** Consider the meaning of ‘local foods’ and analyze the benefits or disadvantages of local food systems versus ‘industrial’ food systems, financially and environmentally. How do you define ‘local’? Does technology, transparency or traceability play a role? Is local important? Does it meet consumer demands? Consider the University of Michigan (Links to an external site.) case study. Discuss and support your argument with evidence from the case study, and from outside sources if necessary.

**Purchase:** [https://hbsp.harvard.edu/import/861941](https://hbsp.harvard.edu/import/861941)

**Due Date:** October 22, 2021 at 11:59pm

**Select case for final submission by first class of week. Inform the instructor for feedback**

## 10/20: Impact Analysis of Sustainable Food

**Guest Speaker**

- Guest Speaker, Chris Adamo, VP, GA and Policy, Danone. (Links to an external site.)
- 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
**Readings:**


**10/25:**

- Impact analysis will be linked to incentives—this module will discuss how incentives can be effectively used to promote change
- How GHG assessment of environmental and financial impacts using metrics such as GHG intensity.

**Readings**

- Blanco, Craig, Sheffi. A Supply Chain View of Product Carbon Footprints: Results from the Banana Supply Chain. Download Blanco, Craig, Sheffi. A Supply Chain View of Product Carbon Footprints: Results from the Banana Supply Chain

**Final In Class Discussion:** students will be asked to bring in examples of products they’ve identified for discussion and tasting with the class. Have a viewpoint on production, certifications, packaging, format and consumer demand.

**Final Case Study Due:** Discuss product industry of choice.

**Due Date:** October 29, 2021, 11:59pm

**Additional Optional Readings:**

COVID-19 Classroom Expectations Statement

Students, faculty, and staff must comply with University expectations regarding appropriate classroom behavior, including those outlined below and in the COVID-19 Code of Conduct. With respect to classroom procedures, this includes:

- Policies regarding masking and social distancing evolve as the public health situation changes. Students are responsible for understanding and complying with current masking, testing, Symptom Tracking, and social distancing requirements.

- In some classes, masking and/or social distancing may be required as a result of an Americans with Disabilities Act (ADA) accommodation for the instructor or a student in the class even when not generally required on campus. In such cases, the instructor will notify the class.

- No food is allowed inside classrooms. Drinks are permitted, but please keep your face covering on and use a straw.
• Faculty may assign seats in some classes to help facilitate contact tracing in the event that a student tests positive for COVID-19. Students must sit in their assigned seats.

If a student fails to comply with the COVID-19 Code of Conduct or other University expectations related to COVID-19, the instructor may ask the student to leave the class. The instructor is asked to report the incident to the Office of Community Standards for additional follow-up.

Class Recording

This class or portions of this class will be recorded by the instructor for educational purpose and available to the class during the quarter. Your instructor will communicate how you can access the recordings. Portions of the course that contain images, questions or commentary/discussion by students will be edited out of any recordings that are saved beyond the current term.

Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of University policy and state law. Students requesting the use of assistive technology as an accommodation should contact AccessibleNU. Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited. Under the University’s Copyright Policy, faculty own the copyright to instructional materials – including those resources created specifically for the purposes of instruction, such as syllabi, lectures and lecture notes, and presentations. Students cannot copy, reproduce, display, or distribute these materials. Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be referred to the appropriate University office for follow-up.

Expectations for Class Participation

Being prepared for class is about more than just showing up, it’s also about making sure you’ve completed the readings, homework, etc. so that you are able to make thoughtful contributions during class. Sitting silently and/or being unprepared can damage your participation grade. When in a virtual class, we expect students to keep their camera and mute on as much as possible. When in the classroom, we expect students to keep their phones off and put away.

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.

The Writing Place

When working on writing assignments for this class, I encourage you to visit the Writing Place, Northwestern’s peer writing center. You will work with juniors and seniors who have been trained to provide you feedback and assistance on any type of writing at any stage in the writing process. They will not edit your work. Rather, they will work with you to brainstorm ideas, organize or outline an essay, clarify your argument, document your sources correctly, or refine grammar and style.

Accessibility Statement

Northwestern University is committed to providing the most accessible learning environment as possible for students with disabilities. Should you anticipate or experience disability-related barriers in the academic setting, please contact AccessibleNU to move forward with the university’s established accommodation process (e: accessible@northwestern.edu; p: 847-467-5530). If you already have established accommodations with AccessibleNU, please let me know as soon as possible, preferably within the first two weeks of the term, so we can work together to implement your disability accommodations. Disability information, including academic accommodations, is confidential under the Family Educational Rights and Privacy Act.

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 the illness can be verified (e.g., by University Health Services or other licensed health professionals).

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.