Department of Physical and Environmental Sciences, UTSC

Course Syllabus: EESB16H3S: Feeding Humans: The Cost to the Planet

Winter 2021 • Tuesdays, 6-8 PM • Location: Online Synchronous Lectures and Tutorials

Course Instructor: Mark Hathaway, PhD, Dept. of Physical and Environmental Sciences, UTSC

Office Hours: Tuesdays, 4:00 to 5:00 PM by appointment (use course calendar) via Zoom:
Please book an appointment using the Quercus Calendar by 2 PM on Tuesday

E-mail: mark.hathaway[at]utoronto.ca (e-mail is my preferred method of communication)

Voicemail: (647) 247-6450 (please leave a detailed message)

Teaching Assistant: Stephanie Gagliardi: stephanie.gagliardi[at]utoronto.ca

Note: In general, you can expect an answer to e-mail inquiries within 24 hours from Monday to Friday (inquiries made on Friday will be answered by Monday). Specific questions regarding assignments should be addressed to your TA. Medical certificates and requests for extensions (***made at least 48 hours before the due date & time***) should also be submitted to the course instructor.

Important: To speed processing, please put "EESB16H3" somewhere in the e-mail subject line

Course Description

EESB16 examines the origins and systems of production of the major plants and animals on which humans depend for food. Interactions between those species and systems and the local ecology will be examined, looking at issues of over harvesting, genetic erosion, soil erosion, pesticide use, water and energy usage, greenhouse gas emissions, and the impacts of genetically modified strains. The course explores the history of the current agro-industrial approach to farming and its relationship to agribusiness. The final part of the course will examine a variety of ecological agricultural approaches and issues related to food security and food sovereignty. Throughout the course, the ways that science, technology, economics, politics, and ethics interact in food systems will be explored and analyzed.

Course Learning Outcomes

By the end of this course, students will be able to:

1. Provide an overview and describe how some key animal and plant species were adapted for use as human food via selective breeding in traditional farming systems.
2. Describe the key characteristics and history of industrial farming systems, including their relationship to earlier systems of plantation farming, mechanization, fossil fuel use, and agribusiness.
3. Analyze and explain the relationship between industrial farming systems and the rise of crop yields as well as reasons why, in changing climatic conditions, these systems may pose a problem for long-term food security.
4. Analyze and explain the ways that industrial farming systems may contribute to increasing water, energy, and pesticide usage; contribute to climate change and soil erosion; and undermine biodiversity.
5. Analyze and explain the potential advantages and disadvantages of genetically modified crops and animals, both in terms of food security and environmental effects.
6. Describe and analyze how globalized food systems and agribusiness contribute to problems such as transportation fuel use, increased packaging, and food waste.
7. Describe, analyze, and explain several more sustainable approaches to food production including organic, agroecology and permaculture, agroforestry, aquaponics, and re-localized food production.

Course Organization

Teaching and Learning Philosophy

In this course, it is assumed that all of us (teachers and students) will learn from each other and that students will engage actively with the course readings, lectures, discussions, and assignments. While lively discussion and probing questions are always encouraged, it is also assumed that each person will treat others with respect. Students are expected to do all required (core) readings, attend lectures and tutorials, engage in appropriate practices and methods for assignments, and think critically. Critical thinking may be demonstrated by articulating a clear understanding of key course concepts; applying these concepts appropriately to specific questions and new contexts; putting forth logical arguments backed by appropriate course materials (readings and lectures), examples, and evidence; making connections between different concepts and perceiving broader patterns; and seeking out the concrete implications for values, policies, technologies, and action.

Electronic Devices Policy

During class and tutorial time, the use of electronic devices for making calls, texting, playing games, watching videos, or surfing the internet is prohibited. Computers, phones, and tablets may be used **exclusively** for watching and participating in lectures/tutorials and for taking notes.

Classroom Response System: Acadly

Attendance and active participation in all classes are an essential part of this course. To facilitate your participation in a relatively large, lecture-based class, we will be using the (free) Acadly classroom response system in class. You will be able to submit answers to in-class questions using your laptop or your iOS or Android smartphones and tablets. Attendance for each class will also be taken using Acadly. If this is impossible for you due to an accessibility or related issue, please contact the course instructor. Acadly may also be used in tutorials. There is no cost for using Acadly.

To find out more about Acadly, go to https://www.acadly.com/**.** Links to the iOS and Android apps are included at the bottom of the page. You may either use your phone/tablet during lecture with Acadly, or switch between Zoom and Acadly as required during lectures on you computer. You should receive an invitation to join Acadly before the course begins. If you joined the course late, or if you did not receive an invitation, please contact the course instructor.

Use of Quercus (Portal/Learning Management System)

It is your responsibility to check Quercus frequently (at least once a week). You must have a mail.utoronto.ca (or @utoronto.ca) email address indicated on ACORN to properly receive messages from the course instructor through Quercus. Please note that all written assignments will be submitted through Quercus. It is your responsibility to ensure that your written assignments are uploaded properly in doc, docx, or rtf format only. Please make sure the confirmation page appears after submitting your assignments and, if possible, make a copy of the confirmation page ("print" to a pdf document and save).

Tutorials

Each student will attend ten tutorials (during weeks 2-11 of the course). Please check and confirm your tutorial group on Quercus. Tutorials provide students an opportunity to discuss the course subject matter in a smaller group as well as to prepare for course assignments and tests. Each tutorial will be led by one of the teaching assistants. Attendance is required to ensure adequate preparation for tests and assignments and active participation will also be part of your participation grade.

Evaluation

The grades for the course will be based on the following percentages for each activity:

Participation (see details below)	20%
Quiz #1: Feb. 5-8 (F-M) via Quercus	6.66%
Assignment #1: Due Monday, March 1	25%
Quiz #2: March 12-15 (F-M) via Quercus	6.66%
Quiz #3: April 9-12 (F-M) via Quercus	6.66%
Reading Review (see assignment details – varies from student to student)	8%
Reading Review Response (see assignment details – varies from student to student)	2%
Final Assignment (Assignment #2): Final written work due on April 19. (NB: Those doing in-class presentations will present on April 6: See assignment details for information.)	25%

Reading Review and Reading Review Response

Each student will be assigned one reading to review during different weeks of the course and one reading review response. Details on dates on format will be available on Quercus. Note that the length and late penalties for reading reviews and responses are different from those for assignments. Reading reviews are submitted, first via the assignment function on Quercus, and then on the discussion forum. Reading review responses are only submitted on the discussion forums.

Participation (20%)

Students are expected to attend all course lectures and tutorials and to participate actively in tutorial discussions and activities. Lecture and tutorial participation marks will be based on both attendance and active participation (in class, based on use of the Classroom Response System). As well, students may earn participation marks by participating in the (anonymous) mid-term course evaluation.

Activity	Marks	Maximum Possible
Lecture attendance and participation	1.0/class	12.0
Tutorial Participation (10 tutorials)	1.0/tutorial	10.0
Mid-term Course Evaluation (due Feb. 25)	2.0	2.0
Maximum Total Possible:		**20.0**

Other bonus participation opportunities may be posted during the course. Also note that, while a student could theoretically earn more than 20 participation marks, the actual maximum is 20. If you miss a lecture or tutorial, however, you do have the opportunity to make up those marks via other activities.

Assignments

There will be two written assignments. Details of each assignment will be posted on Quercus along with a rubric detailing the criteria for evaluation. Assignments will be due at 11:59 PM on the dates below:

Assignment #1:	**Monday, March 1**

Assignment #2:	**Monday, April 19**

Online Quizzes (6.66% each – 20% total)

There will be three quizzes:

- The February 5-8 quiz covers required readings and lectures for weeks 1-4
- The March 12-15 covers required readings and lectures for weeks 5-8
- The April 9-12 quiz covers required readings and lectures for weeks 9-12

Each quiz will take place online via Quercus and our open book but time-limited. Each student can attempt each quiz up to three times and only the best attempt will count—but the questions which appear may change on each attempt.

Turnitin

Normally, students will be required to submit their course assignments to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be

included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

If a student does not wish to participate in Turnitin, the student MUST advise the course instructor at least three weeks before the assignment due date as alternate arrangements for screening the assignment must be arranged. (Normally, this will entail the submission of rough notes and drafts along with their final assignment.)

Late and Length Penalties

Please follow the length guidelines for each assignment carefully. A 2% penalty for up to the first 100 words over the maximum length will be deducted from the assignment (i.e. from 1 to 100 words over the limit) and 5% for each additional 100 words (101 to 200 over, etc.).

Late papers will be assessed a 3***% reduction of the value of the assignment per day late***, unless previously negotiated with course instructor over acceptable medical or similar reasons. Unless previously negotiated due to an acceptable issue, ***late papers will only be accepted for one week after the due date***. Papers later than this will not be assessed. ***Please do not leave potential issues to the last minute to discuss with course instructor.***

Note that length and late penalties are different from reading reviews and responses. See the assignment description for details.

If assignments are submitted late because of medical reasons, you must submit an official verification of illness form on ACORN. ***Please inform the course instructor and the TA in advance if you anticipate that your assignment will be late on account of medical reasons.*** After submitting the verification of illness form, let the course instructor and TA know how long you anticipate you will not be able to engage in school work due to illness.

Remarking Policy

If a student believes that their assignment has not been fairly assessed, they should first read all the comments (both in the text and terminal comments) and consult the assignment rubric. If, after reviewing these, the student would like to request a reassessment, they should write their TA – ***within one week of receiving their assignment grade*** – with a written justification explaining why the assignment should be reassessed. The TA will then consider the request and remark if they believe this is justified. If the student is still not satisfied, they may appeal the grade to the course instructor, but must submit a written rationale for doing so.

Course Texts and Required Readings

All course texts will be available online via Quercus. In some cases, to access electronic journal articles and some book chapters, you will need to log into the University of Toronto library.

Note: Students are expected **to read all core readings**. Optional readings are included for those who wish to explore a theme in more depth. Optional readings will not be covered in course tests (unless specific material is also covered in a course lecture), but may be helpful in understanding key ideas and writing your assignment papers. The list of readings with links is included on Quercus.

Course Outline: *Weekly Readings are Posted Directly on Quercus*

Week 1 (January 12): Course Introduction

Learning Outcomes: Students will….

- Gain an overview of the course and have a clear understanding of expectations for participation, assignments, and evaluation.
- Attain an introductory understanding of some of the key ecological challenges associated with modern industrial agriculture.
- Begin to explore how worldviews and ethical frameworks influence science and technology.

Week 2 (January 19): Traditional and Indigenous Food Systems

Learning Outcomes: Students will….

- Be able to describe how food systems evolved from hunting and gathering to horticulture and agricultural systems.
- Gain an appreciation for the diversity of traditional food systems and the traditional ecological knowledge these demonstrate.
- Be able to describe how some key animal and plant species that were adapted for use as human food via selective breeding.

Week 3 (January 26): Industrialized Food Production – History, Characteristics, Challenges

Learning Outcomes: Students will….

- Be able to define industrial agriculture/food production and describe some of its key characteristics.
- Be able to describe and explain how plantation farming, urbanization, mechanization, increased demand for food, fossil fuels, and agribusiness contributed to the rise of industrial farming as well as the influences behind the "green revolution."
- Be able to describe some advantages and limitations of industrial farming systems over earlier forms of food production.

Week 4 (February 2): Pesticides and Chemical Fertilizers

Learning Outcomes: Students will….

- Be able to describe and analyze the relationship between mechanization, monocrop systems, and the use of chemical pesticides and fertilizers.
- Be able to describe the impacts of pesticides and fertilizers on soil health, biodiversity, water quality, and greenhouse gas emissions.
- Begin to explore alternatives for improving soil health, reducing dependence on chemical inputs, reducing water usage, and improving water quality.

Week 5 (Feb. 9): Energy Use, Soil, and Climate Change

Learning Outcomes: Students will….

- Be able to describe and analyze how industrial agriculture contributes to climate change via its dependence of fossil-fuel energy (and globalized transportation networks), fertilizer use, use of packaging, food waste, and soil degradation.
- Begin to explore ways that agriculture might be re-localized, how it might reduce its dependence on fossil fuels, and how soil might serve as a carbon sink.

Week 6 (Feb. 23): Water Usage and Corporate Control of Agriculture

Learning Outcomes: Students will….

- Be able to describe and analyze how industrial farming has increased demand for water and how it negatively affects water quality.
- Begin to examine how corporate control influences agricultural systems, including the control of seeds, agricultural input, and land.

Week 7 (March 2): Livestock and Confined Animal Feeding Operations

Learning Outcomes: Students will….

- Be able to describe and explain how livestock production—particularly in confined animal feeding operations—affects water quality, contributes to climate change and deforestation, and increases the amount of land needed for crop production.
- Explore the ethical dimensions of meat production and consider how reducing meat consumption can benefit ecological health.
- Analyze the possible ways that animals can play a positive role in sustainable food production and consider the advantages and limitations of alternatives to confined feeding operations.

- Explore the advantages and limitations of alternatives, including cultured meat and plant-based meat substitutes, along with other possible dietary changes.

Week 8 (March 9): Genetically Modified Crops

Learning Outcomes: Students will….

- Become familiar with approaches to genetic engineering, particularly recombinant DNA and CRISPR gene editing, along with some of the possible advantages, dangers, and limitations of each technique.
- Be able to describe the potential of genetically modified crops to contribute to or undermine food security and ecological sustainability.

Week 9 (March 16): Fisheries, Aquaculture, & Genetically Modified Animals & Fish

Learning Outcomes: Students will….

- Be able to describe and analyze how industrial-scale fishing and aquaculture have impacted biodiversity and the health of aquatic ecosystems.
- Consider more ecologically sustainable approaches to raising fish.
- Be able to describe and analyze some of the advantages and dangers posed by genetically modified animals and fish.

Week 10 (March 23): Sustainability, Regeneration, and Organic Agriculture

Learning Outcomes: Students will….

- Be able to explain the difference between sustainable and regenerative approaches to agriculture.
- Be able to describe, analyze, and explain several more sustainable approaches to food production including organic agriculture, agroecology and permaculture, and agroforestry.

Week 11 (March 30): Agroecology, Permaculture, and Regenerative Food Production

Learning Outcomes: Students will….

- Be able to explain how agroecology and permaculture employ ecological principles and practices.
- Be able to describe concrete examples of how agroecology has contributed to ecological regeneration and food sovereignty different contexts.
- Be able to describe and analyze some obstacles that impede the transition to regenerative agriculture.

Week 12 (April 6): Course Conclusion, Presentations, and Final Evaluation

Learning Outcomes: Students will….

- Learn more about sustainable and regenerative approaches to agriculture via diverse project presentations.
- Reflect on and integrate their leaning to date regarding the ecological costs of current food production approaches to the planet as well as more sustainable—even regenerative—alternatives.

Other Administrative Issues

Accessibility Needs and Services

The University of Toronto is committed to accessibility. The office of Accessibility Services at U of T provides a range of services to students with disabilities to help them meet their educational objectives. In conjunction with Accessibility Services, the course instructor and teaching assistant would like to ensure the inclusion and full participation of everyone in the course. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: https://www.utsc.utoronto.ca/~ability/. As well, if there are things that we can do to facilitate your learning, or that we need to know as members of the teaching team, please contact the instructor during the first few weeks of the course

Academic Integrity and Plagiarism

Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree

that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

Familiarize yourself with the University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm), the rule book for academic behaviour at the U of T. ***You are expected to know the rules.*** Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks.
- Submitting your own work in more than one course without the permission of the instructor.
- Including references to sources that you did not use.
- Obtaining/ providing unauthorized assistance on any assignment including working in groups on assignments that are supposed to be individual work or having someone rewrite or add material to your work while "editing".
- Making up sources or facts.
- Lending your work to a classmate who submits it as their own without your permission.

On tests and exams:

- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers
- Letting someone else look at your answers.
- Misrepresenting your identity.
- Submitting an altered test for re-grading.

Misrepresentation:

- Falsifying or altering any documentation required by the University, including doctor's notes.
- Falsifying institutional documents or grades.

You can get further guidance on academic integrity at: utsc.utoronto.ca/vpdean/student-academic-integrity-overview

To remind you of these expectations, and help you avoid accidental offences, I will post an **Academic Integrity Checklist** with each assignment on Quercus. ***By submitting your assignment, you confirm that you have read the checklist and affirm that its statements are true***.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you have questions about appropriate research and citation methods, seek out additional information from me, or from other available campus resources like the U of T Writing Website. If you are experiencing personal challenges that are having an impact on your academic work, please speak to the course instructor or seek the advice of your registrar.

University of Toronto Writing Centres

Students having difficulty with writing skills, or those who would simply like to improve their ability, are encouraged to visit the UTSC writing centre. The writing centre offer free individual tutoring, group workshops, and other resources. For more information, see the UTSC website (https://utsc.utoronto.ca/twc/).