This interdisciplinary course examines the environmental, social, and economic dimensions of agriculture, and relevant emerging challenges involving climate change, and resource depletion and degradation, particularly in tropical environments. It treats the Green Revolution, capital-intensive/high-input practices, and corporate agriculture. Students will learn about the implications of “conventional” agriculture for environmental protection, and food systems, security, and sovereignty. Additionally, students will explore the principles and practice of alternatives, including integrated crop and pest management, agroforestry, permaculture, plus organic, sustainable, and “climate smart” agriculture. Using a framework of “systems thinking”, and drawing analogies between agricultural and ecological systems, the course explores the multiple drivers, inputs, and outputs of agricultural production and trade. Students will have firsthand, immersive experiences with production systems that are wide-ranging, and will explore the costs and benefits of each, through the lens the environment, economy, and society.

**Learning Objectives**

By completing this course, students will:

- Be able to define the terms “sustainable agriculture” and “food security” from multiple perspectives
- Differentiate types of sustainable agriculture systems (e.g. conservation agriculture, organic, biodynamic, permaculture, climate smart agriculture, etc.), their origins, and advantages and disadvantages
- Be able to succinctly summarize why sustainable agriculture is not merely desirable, but necessary in order to meet coming global challenges
- Synthesize this knowledge and the costs and benefits of the perspectives explored, using both oral and written language.

**Course Prerequisites**

None

**Methods of Instruction**

This course is highly interactive and combines discussions (about the texts, films, etc.), in-class group work, and in-class presentations. The more theoretical parts of class sessions will sometimes consist of short lectures as well. Students will be asked to do their own fieldwork (e.g. taking photos, interviewing locals, local organizations, or other students) that will also be discussed in class. Since this course is designed to be highly interactive, students are expected to take part in discussions and debates, which will in most cases not be about “right” or “wrong”, but rather about finding individual and new approaches to framing the ecosystem intellectually, and using plausible arguments to analyze and evaluate the ways humans approach nature and its resources. The overall aim of the course is to learn how to think critically and originally. In order to encourage enquiry-based learning, students will be asked to answer questions, either individually or in groups, about an assigned text, film, initiative, etc. The instructor will use a broad selection of teaching methods including PowerPoint, audio-visual material, guest lectures, excursions, but also personal narrative, group work, and traditional teaching units.

**Assessment and Final Grade**

1. Critical Reflections (3) 15%
2. Group Presentation 25%
Course Requirements

Critical Reflections (3)

Students will be presented with three individual types of food systems for debate and consideration. They will compose a 500-word response to each of the provocations. The first critical reflection will require them to discuss a major sustainable agricultural move to cater for the global water crisis. The second reflection will involve them in exploring a current national or global suggestion to meet food security issues in a country of their choice. The third provocation will require them to discuss three major food systems that are most effective in addressing globalization and the population explosion. The reflections will be graded by how comprehensively and critically they address and respond to the different issues and provocations, drawing on the course readings and in-class discussions.

Group Presentation

Each student is expected (together with one or two other students) to lead a 15-minute presentation on a text or topic (chosen from a selection provided at the start of the course). Following the formal presentation, the group will pose questions to the class, which are meant to spark discussion. One week before the presentation, the group meets with the instructor to discuss possible questions. It is expected that at that point they have all read the assigned text, have thought about the topic, and suggest a question or two. The group then decides which questions to choose, together with the instructor. Following that meeting each presenter has time to prepare additional questions/input that she/he will use during the discussion to further inspire the conversation. The presentation also includes a written self-assessment after the event: what went well? What didn’t? What would I do differently if I were to do this again? The self-assessment must be submitted on the Monday following the event and will be commented on by the instructor who adds his/her impression of the presentation.

Please Note: It is important that you see your instructor at least one week before your presentation to discuss possible lead questions, topics, and potential pitfalls. The grade results from the overall quality of the presentation (10%) and the way the presentation is prepared and carried out by each individual student (10%). While the first part of the grade will be the same for all in the group, the second may vary, depending on the individual student’s performance.

Field Research and Written Analysis

Students are required to submit a written reflection on the out-of-classroom field excursion undertaken during the course. This should creatively utilize different forms of media (such as photographs, diagrams, etc.) as well as written documentation and evaluation of site visit observations (that you can, ideally, save as part of a course portfolio and a memory of your time abroad).

The evaluation must be 1500-words in length and include at least two scholarly sources. It will be graded based on a student’s demonstrated understanding of syllabus concepts and how these may be applied in practice. More detailed instructions will be given in advance of this assignment. The Field Research and Written Analysis must be submitted by the last week of the course.

Essay

Students will be required to select a topic on sustainable agriculture that is implemented in the host environment. They will describe the system and how it is implemented in the specific location. They will compare this with how the system is implemented in another country of the students’ choice with the differences critically reviewed. The essay will be 2000 words exactly and consist of an introduction to the system, a description of the location implementing the system, and an analysis of the successes and challenges. It will then close by comparing the outcomes with another country. The essay will be graded on a student’s ability to identify, elaborate and describe how the sustainable agricultural system is implemented in a specific context and the elements used to compare the implementation in another country, drawing on the course readings.

Participation

Participation is valued as meaningful contribution in the digital and tangible classroom, utilizing the resources and materials presented to students as part of the course. Meaningful contribution requires students to be prepared in advance of each class session and to have regular attendance. Students must clearly demonstrate they have engaged with the materials as directed, for example, through classroom discussions, online discussion boards,
peer-to-peer feedback (after presentations), interaction with guest speakers, and attentiveness on co-curricular and outside-of-classroom activities.

**Attendance**

Regular class attendance is required throughout the program, and all absences will result in a lower participation grade for any affected CIEE course. Due to the intensive schedules for Open Campus and Short Term programs, absences that constitute more than 10% of the total course will result in a written warning.

Students who transfer from one CIEE class to another during the add/drop period will not be considered absent from the first session(s) of their new class, provided they were marked present for the first session(s) of their original class. Otherwise, the absence(s) from the original class carry over to the new class and count against the grade in that class.

For CIEE classes, excessively tardy (over 15 minutes late) students must be marked absent.

Attendance policies also apply to any required co-curricular class excursion or event, as well as to any required field placement. Students may not miss placement/work hours at an internship or service learning site unless approved in advance by the Academic Director and placement supervisor. All students must complete all of the requisite 100 minimum work hours on site at the internship or service learning placement to be eligible for academic credit.

Students who miss class for personal travel, including unforeseen delays that arise as a result of personal travel, will be marked as absent. No make-up or re-sit opportunity will be provided.

Attendance policies also apply to any required class excursion, with the exception that some class excursions cannot accommodate any tardiness, and students risk being marked as absent if they fail to be present at the appointed time.

Absences for classes will lead to the following penalties:

<table>
<thead>
<tr>
<th>Percentage of Total Course Hours Missed</th>
<th>Minimum Penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10%</td>
<td>Participation graded as per class requirements</td>
</tr>
<tr>
<td>10 – 20%</td>
<td>Participation graded as per class requirements, 3% grade penalty &amp; written warning</td>
</tr>
<tr>
<td>More than 20%</td>
<td>Automatic course failure, and possible expulsion</td>
</tr>
</tbody>
</table>

N.B. Course schedule is subject to change due to study tours, excursions, or local holidays. Final schedules will be included in the final syllabus provided to students on site.

**Weekly Schedule**

**Week 1**

Class: 1.1 Introduction

We will use this first day of class to get to know each other, understand who we are in the context of the larger, cultural, regional and climate-specific agri-systems we individually come from and discuss sustainable cultural alternatives to the status quo.

Reading:
Week 2

Class: 2.1 Global Change and Sustainable Agriculture

In this session, we will examine the food-climate-energy-water-poverty nexus.

Reading:

Class: 2.2 Culture and Agriculture in the World

In this session, we will critically review definitions and measurement methods for food security and insecurity.

Reading:

Due Date for Submission of the Critical Reflection # 1

Week 3

Class: 3.1 The Climate Connection

This session will examine how climate change impacts food production and how food production impacts climate change.

Reading:

Class: 3.2 Land, Soil and Water: The Crucible of Terrestrial Life

This session examines understandings of the foundation of life on terrestrial surfaces, covering issues such as soil fertility and nutrient cycling, land degradation, water quality and quantity, and evolving soil and water management practices in agroecosystems.

Reading:

Class: 3.3 The Food System in Crisis

In this session, students will conduct their 15-minute Group Presentations, including class discussion of questions posed by each group.

Reading:

Due Date for Submission of the Group Presentations

Week 4

Class: 4.1 Global Population Growth

This class will address the challenges of feeding 9.6 billion people by 2050. We will give consideration to various issues such as geographic disadvantage and globalisation, as well as gender equity and the role of women in global agriculture.
Class: 4.2  Livestock Systems

In this session, we will consider how we define our relationship with animals and explore livestock production systems, concentrated animal feeding operations (CAFOs), husbandry, and the growing demand for animal products.

Reading:

Optional Viewing:
Eating Animals (2017). Documentary (Based on book 'Eating Animals' by Jonathan Safran Foer, directed by Christopher Dillon Quinn and narrated by Natalie Portman).

Class: 4.3  Fertilizers and Fertility

In this session, we will discuss costs, benefits, and future scarcity of inorganic fertilizers and consider alternatives to conventional farm inputs, including practices such as organic farming and biochar application.

Reading:

Date Due for Submission of the Critical Reflection # 2

Week 5
Class: 5.1  Opportunities in the Changing Face of Agribusiness

Though traditionally the realm of government and academic institutions, developments in agribusiness are increasingly being found in partnerships and alliances between research organisations and industry; involving a wide range of players from multi-national agribusiness giants through to small-scale start-ups and savvy investors. Innovations emerging from the agriculture and food sectors are delivering products and tools to improve efficiency and productivity and assist in adaptations to climate change and shifting dietary preferences. This class will include a Guest Lecture from a representative of the agriculture and food team at the host country’s national research agency (or similar, TBC).

Reading:

Date Due for Submission of the Critical Reflection # 3

Class: 5.2  Site Visit: Integrated Whole-Systems Thinking in Agriculture

This class will involve a co-curricular activity involving an excursion to a farm located in close proximity to the city of study. An on-site farm tour will introduce students to basic principles of permaculture, a systems approach that mimics the patterns and relationships found in natural ecosystems and seeks to apply these in a holistic way to agricultural production and human habitation. The tour will give students a practical understanding of alternative agricultural techniques as well as the opportunity to interact with farm animals, observe the native countryside and wildlife and engage with the host country’s culture outside of the city.

Reading:
**Week 6**

**Class: 6.1 Bio-futures: The Potential of Bio-fuels and Bio-products**

This class will explore a range of exciting developments in the area of biotechnology, biofuels and other industrial bio-products (such as bio-based alternatives to plastics). We will also consider risks and social implications of these agri-scientific advances, including labeling, food movements and other emerging issues.

**Reading:**


**Due Date for Submission of Essay Topic**

**Class: 6.2 Sustainable Strategies**

This class will review concepts presented throughout the course, and discuss what it would take to achieve a sustainable global agricultural production system – increased production intensity? More technology and innovation? Community-building and connectedness? Or perhaps, all of the above?

**Reading:**


**Due Date for Submission of Field Research and Written Analysis**

**Course Materials**

**Readings**


Ronald, P. (2011). "Plant Genetics, Sustainable Agriculture and Global Food Security". Genetics; 188(1), pp11-