

**Food For All: Ecology, Biotechnology and Sustainability**  
**BIO 185 / ENV 182 / NUTR 241-01**  
Spring 2017

**Section 1:**

Anderson Hall Room 312, Wednesday 3:00-6:00 pm

**Section 2:**

Anderson Hall Room 312, Wednesday 3:00-4:00 pm

Anderson Hall Room 212 Wednesday 4:00-6:00pm

**Instructors:**

**Colin Orians – Section 1**

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**Sara Gomez – Section 2**

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Office hours: Tuesday 9:30-11:00 or by appointment

**Teaching Assistant:**

Danielle Ngo

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**Course Description:**

With the human population expected to exceed 9 billion by 2050, how will we support our farmers and meet the increasing demand for food in an ecologically sustainable way? Historically, rapid increases in yield have been a result of advances in three main technologies: (1) genetic improvement; (2) use of synthetic pesticides and fertilizers; and (3) expanded irrigation. Each of these technological advances, however, has limitations or has led to significant environmental degradation. There is an urgent need for new approaches to food production without destroying the environment.

We will evaluate: (1) how ecological knowledge makes food production more sustainable; (2) what existing and emerging approaches can contribute to a reliable supply of nutritious food; and (3) the political and economic drivers that shape who has access to these technologies. We will also explore stakeholder-specific perspectives, as well as develop important communication skills for negotiating these different perspectives.

Prerequisites: Introductory Biology or equivalent.

**Course Learning Objectives:**

- LO1 *Develop disciplinary literacy* on ecological and biotechnological approaches to meeting future security needs
- LO2 *Explore interdisciplinary solutions* to complex problems related to the food system
- LO3 Gain skills in *persuasive* communication to and from contrasting stakeholder positions

## **Assignments (learning objective; grading weight)\***

- Discussion leader (LO 1; 20%): Student teams will lead a discussion once during the semester using pre-assigned readings.
- Written responses (LO 2; 15%): Students must write 150-200 words on the assigned class readings and post their comments on Trunk in advance (by 9am the day before class).
- Op-ed (LO 3; 10%): Students will write an Op-Ed piece on a specific topic assigned by the instructors.
- Negotiation exercise (LO 2, LO3; 15%): A two-part negotiation exercise will be conducted in class. This will be graded based on a) preparation before the exercise and b) a response paper.
- Final Project on food item (LO1, LO2, LO3; 30%): In teams of two students will research, write a 5-page single-spaced paper (20%) and give a 15 min presentation (10%). Focusing on a food item on your plate, you have two options to complete the assignment.
- In-class participation (LO2, LO3; 10%): Students will be graded on their participation during class discussions and exercises.

**\* Detailed instructions about each assignment will be posted in Trunk.**

### **Attendance:**

Given the discussion-based nature of this class, students must be present in every class. Unjustified absences will impact the participation grade. Students missing more than 2 classes will need to withdraw from the class.

### **Penalties for late or incomplete assignments:**

Late assignments will not be accepted unless arrangements are made in advance with instructor.

### **Academic Conduct:**

Academic integrity, including avoiding plagiarism, is critically important. Each student is responsible for being familiar with the standards and policies outlined in each School's *Policies and Procedures* manual. e.g.,

AS&E: <http://uss.tufts.edu/studentaffairs/judicialaffairs.asp> - [academicintegrity](#)

Nutrition: <http://nutrition.tufts.edu/student/documents>

It is the responsibility of the student to be aware of, and comply with, these policies and standards. In accordance with Tufts University's policy on academic misconduct, violations of standards of academic conduct will be sanctioned by penalties ranging from grade reduction or failure on an assignment; grade reduction or failure of a course; up to dismissal from the school, depending on the nature and context of any infraction.

## Course & Assignment Schedule

Week	Date	Topic	Assignment due
1	Jan 25	<b>Course introduction</b> <b>Lecture:</b> Soil-Water-Plant Nexus	
2	Feb 1	<b>Lecture:</b> Weed Management <b>Student-led discussion 1:</b> <i>Soil-Water-Plant Nexus</i>	
3	Feb 8	<b>Lecture:</b> Insect Pest Management <b>Op-ed Introduction</b> <b>Student-led discussion 2:</b> <i>Weed Management</i>	Topic selection for final project
4	Feb 15	<b>Lecture:</b> Nutritionally-improved Crops <b>Student-led discussion 3:</b> <i>Insect Pest Management</i>	
5	Feb 22	<b>Lecture:</b> Meet The Farmer I <i>Guest speaker: Alain Pincot, Bonipak farms, CA</i> <b>Op-ed debriefing</b> <b>Student-led discussion 4:</b> Nutritionally-improved Crops	Op-ed
6	Mar 1	<b>Guest panel:</b> Meet The Farmer II <b>Student-led discussion 5:</b> <i>Lentil Underground (Book)</i>	
7	Mar 8	<b>Lecture:</b> Animal Production <i>Guest speaker: Alex Blanchette</i> <b>Student-led discussion 6:</b> <i>Animal production</i>	
8	Mar 15	<b>Lecture:</b> Food Systems Modeling <i>Guest speaker: Chris Peters</i> <b>In-class exercise</b>	Outline for final project
<b>Mar 22 Spring break – no class</b>			
9	Mar 29	<b>Lecture:</b> Biotechnology Transfer in Rural Areas <i>Guest speaker: Kyle Emerick</i> <b>Student-led discussion 7:</b> <i>Biotechnology Transfer</i>	
10	Apr 5	<b>Lecture:</b> Climate Change Impacts on Agriculture <b>Student-led discussion 8:</b> <i>Climate Change impacts</i>	
11	Apr 12	<b>Final presentations</b>	<b>Attention:</b> Final project paper due on April 14 <sup>th</sup>
12	Apr 19	<b>Negotiation exercise (Part 1)</b> <i>Guest presenter: Rishi Bhandary</i>	Negotiation strategy due
13	Apr 26	<b>Negotiation exercise (Part 2)</b> <i>Guest presenter: Rishi Bhandary</i>	<b>Attention:</b> Negotiation reflection due on April 29 <sup>th</sup>

The class schedule is subject to modification at the discretion of the instructors.