**BIO 185: Food For All**  
Ecology, Biotechnology and Sustainability

Food For All: Ecology, Biotechnology and Sustainability  
BIO 185 / ENV 182 / NUTR 241-01 / DHP-D250-01  
Spring 2019

**Section 1:**  
574 Boston Ave, Room 202 Monday 1:30 - 2:30 pm  
574 Boston Ave, Room 310 Monday 2:30 - 4:15 pm

**Section 2:**  
574 Boston Ave, Room 202 Monday 1:30 – 4:15 pm

**Instructors:**

Colin Orians – Section 1  
colin.orians@tufts.edu  |  617-627-3543  |  Robinson Hall, room 364  
Office hours: Tuesday 1:30-3:30 or by appointment

Sara Gomez – Section 2  
sara.gomez@tufts.edu  |  617.627.3553  |  SEC building, room 341  
Office hours: Tuesday 3:15-4:15 or by appointment

**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***

- **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 7pm 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 preparation before the exercise, participation during the negotiation and a response paper.
- **Final Project (LO1, LO2, LO3; 30%)**: Teams of two students will choose a crop or animal and develop a well-researched sustainable production plan integrating technological and ecological methods to address current challenges. Each group will present their research through an individual 5-page single-spaced paper (20%) and a joint 15 min presentation (10%).
- **In-class participation (LO2, LO3; 10%)**: Students will be graded on their participation during class discussions and exercises.

*For detailed instructions consult the Assignment section in Canvas*

**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](http://uss.tufts.edu/studentaffairs/judicialaffairs.asp - academicintegrity)  
Nutrition: [http://nutrition.tufts.edu/student/documents](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

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignment due</th>
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<tbody>
<tr>
<td>Jan 23 (Wed!)</td>
<td>Course introduction&lt;br&gt;Lecture: Soil-Water-Food</td>
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<tr>
<td>Jan 28</td>
<td>Lecture: Weed Management&lt;br&gt;&lt;b&gt;Student-led discussion 1: Soil Health&lt;/b&gt;&lt;br&gt;Guest speaker: Library Tutorial – Nicole Bookout</td>
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<td>Feb 4</td>
<td>Lecture: Insect Pest Management&lt;br&gt;&lt;b&gt;Student-led discussion 2&lt;/b&gt;</td>
<td>Topic selection for final project due</td>
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<td>Feb 11</td>
<td>Lecture: Animal Production&lt;br&gt;Guest speaker: Tim Griffin&lt;br&gt;&lt;b&gt;Student-led discussion 3&lt;/b&gt;</td>
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<td>Feb 21 (Thurs!)</td>
<td>Lecture: Climate change and Food Production&lt;br&gt;&lt;b&gt;Student-led discussion 4&lt;/b&gt;</td>
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<td>Feb 25</td>
<td>Lecture: Tomorrow’s table&lt;br&gt;Guest speaker: Pam Ronald&lt;br&gt;&lt;b&gt;Student-led discussion 5&lt;/b&gt;</td>
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<td>Mar 4</td>
<td>Meet The Farmer I&lt;br&gt;Guest speaker: Alain Pincott&lt;br&gt;Op-ed debriefing</td>
<td>• Op-ed (due on Wed Feb 27)&lt;br&gt;• Outline for final project (Mar 5)</td>
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<td>Mar 11</td>
<td>Meet The Farmer II&lt;br&gt;Guest speakers: Ann Harris, Hillevi Jaegeran, TBD&lt;br&gt;&lt;b&gt;Student-led discussion 5: Farmer resilience&lt;/b&gt;</td>
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<td>Mar 18</td>
<td>Spring break</td>
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<td>Date</td>
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| Mar 25| **Lecture:** Biotechnology Transfer in Rural Areas  
*Guest speaker:* Kyle Emerick  
*Student-led discussion 7* |                                                                 |
| Apr 1 | **Lecture:** Lab to Table and the Future of Food  
*Guest speaker:* Natalie Rubio  
*Student-led discussion 8* |                                                                 |
| Apr 8 | **Final Project presentations**                                                   | Final project paper due on April 18th                                 |
| Apr 15| **No Class**                                                                     |                                                                 |
| Apr 22| **Negotiation exercise (Part 1)**  
*Guest speaker:* Andrew Tirrell                                                   | Negotiation strategy due                                               |
| Apr 29| **Negotiation exercise (Part 2)**  
*Guest speaker:* Andrew Tirrell                                                   | Negotiation reflection due on May 1st                                 |

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