NUTR 333: Agricultural Science and Policy II
Fall 2022

Class Time: Tuesday & Thursday, 10:30am – 12:00 noon
Room 118 Jaharis

Instructor: Tim Griffin
  Phone: 617-636-3613
  Email: Timothy.Griffin@tufts.edu
  Student hours: Monday, 9:15 - 10:00 am (virtual - see Zoom link on Canvas)
  Thursday, 1:30 pm – 2:30 pm (Jaharis 125)
  Or arranged by request

TA: Olivia Novak   Olivia.Novak@tufts.edu
  Student hours: Wednesday, 8:00 – 9:00 am
  (virtual – see Zoom link on Canvas)

Course Goals:

This course is the second part of a two-semester sequence in agricultural policy and science. The principle foci of this course are the complex systems-level aspects in agriculture and the food system, including: pest management, animal production systems, food from the water (New in 2022), and a critical assessment of the land-sparing paradigm.

Who Can/Should Take This Course:

This course is required for AFE students. The material builds on concepts from NUTR 233 (Agricultural Science and Policy I) and also from NUTR 215 (Fundamentals of U.S. Agriculture). Hence, both NUTR 215 and NUTR 233 are required prerequisites for NUTR333. There is a focus on integrative thinking in this course.

Course Website

The course website is on the CANVAS platform (https://login.canvas.tufts.edu/). If you are registered for this course, you should receive an e-mail with instructions. To log on to the site, enter your Tufts UTLN (same login you use for Webmail) and assigned password. In addition, you will need to use a second method of verification if you are enrolled in Tufts' two-factor authentication system (https://it.tufts.edu/2fa). If you have any problems logging onto CANVAS, please let me know as soon as possible.

Classroom Conduct & Participation

The number one priority for this class is to maximize your learning and long-term retention related to the above objectives. We aim to do this by creating a dynamic, active learning environment together with you. There will be frequent in-classroom discussions and activities, and it is critical that you do two things 1) actively and respectfully participate and 2) read or watch required materials prior to coming to class.

You can enhance your learning by participating actively and taking notes *thoughtfully and selectively*. Using a laptop to take notes will allow you to capture more information, but you may cognitively process, and thus retain, less information. As such, I encourage hand-written but permit electronic note taking. Laptops should not be used for personal purposes during class.
Finally, please turn off or silence your cell phone prior to the start of class.

Academic Integrity

Each student is responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures Handbook and Tufts University policies (http://students.tufts.edu/student-affairs/student-life-policies/academic-integrity-policy). It is the responsibility of each student to understand and comply with these standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

In particular, plagiarism will not be tolerated under any circumstance. Avoiding plagiarism is outlined in section IV of the above booklet. I reserve the right to use the anti-plagiarism program, Turnitin.com, to evaluate any and all student writing assignments. Please speak with me if you have any questions about these policies.

Accommodation of Disabilities

Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Diversity Statement

Diverse student experiences and perspectives are essential to deepening our collective knowledge in this course. I consider it part of my responsibility as a teacher to address the learning needs of all students in this course. It is my intent to present materials respectful of diversity: race, ethnicity and national origins, gender and gender identity, sexuality, socioeconomic status, religious beliefs, ability, political preference, and age, among other personal characteristics. Your suggestions on how I can improve are encouraged and appreciated.

Penalties for late or incomplete assignments:

Please notify me least 48 hours in advance if you know you will be unable to meet a deadline, or as soon as possible in the event of an emergency. Assignments that are turned in late without advanced notice will be reduced by 5% (half a letter grade) the first day they are past due, and 5% each day thereafter. **If you anticipate being unable to complete an assignment on time, please let me know!!**

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Grading Range

The grade range used in this course is shown below. Please note that a passing grade for Friedman School students is B- or above.

A+ = 97 - 100
A = 93 - 96.9
A- = 90 - 92.9
B+ = 87 - 89.9
B = 83 - 86.9
B- = 80 - 82.9
C+ = 77 - 79.9
C = 73 - 76.9
C - = 70 - 72.9
D+ = 67 - 69.9
D = 63 - 66.9
D- = 60 - 62.9
F = Below 60

Readings & Resources

The ***core required readings (and in some cases, videos or other media)*** are posted online, on the course CANVAS site. *They are grouped by date.* You are expected to have read these (or listened/watched, in the case of podcasts and videos) in advance of each class. The purpose of the required readings is to supplement the material presented and discussed during class sessions. There will be several occasions when we spend class time discussing a specific reading (I will let you know in advance), but that will be the exception and not the rule.

Questions are Essential and Encouraged!

There will be some technical facts that we will assess through the semester, and having an understanding of these is important, for this class and also in the future. It is also critical that you **both** question these data **and** ask questions. Of course, you may direct questions to me but I also encourage you to question each other, guests in class, and the like.

Questions about course content should be brought to class, office hours, or posted on the online forum available on Canvas for each week where they can be answered for the benefit of all students.

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Course Content

Topic Areas and Learning Objectives

The class is built around four broad topical areas, each with their own learning objectives.

Pest Management

- Identify primary impacts of the major categories of agricultural pests on productivity
- Develop specific, actionable changes in regulation and use of pesticides (**Assessment**: OpEd article)
- Describe trade-offs associated with non-pesticidal management of agricultural pests
- Identify core concepts and laws that regulate pesticides in the U.S.
- Assess trade-offs and synergies between public health, environmental outcomes, and agricultural pest management strategies

Livestock Systems

- Summarize nutritional requirements of livestock animals across life stages
- Identify key similarities and differences between conventional (*status quo*) and alternative livestock production paradigms
- Categorize advantages of grain-based and grass-based livestock production systems
- Quantify use of antimicrobial drugs across livestock types in the U.S.
- Illustrate primary outcomes of concern and specific risks associated with use of antimicrobial drugs in the livestock sector (**Assessment**: Policy Memo)

Food from the Water

- Summarize key principles of fisheries ecology and management
- Articulate the primary nutritional outcomes and sustainability challenges associated with both wild-caught seafood and aquacultural production
- Describe key issues regarding treatment of workers in fisheries globally
- Develop mutual gains solutions to the Seafood Paradox (**Assessment**: Video on Flashpoints in Fisheries)

Land-Sparing and Sustainable Intensification

- Define and critique the concepts of sustainable intensification and land-sparing
- Diagram the yield gap concept, and explain and how they are interpreted
- Categorize the mechanisms by which food is lost and/or wasted
- Formulate local to global strategies to increase food output and quality while mitigating impacts in other domains

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Course Schedule at a Glance

I. PEST MANAGEMENT

Sept 6   Introduction; Collective Knowledge on Agricultural Pests
Sept 8   Pest Problems and Management in Agriculture - Part I
Sept 13   Alternative Pest Management Strategies: Eric Brennan, USDA-ARS
Sept 15   Pest Problems and Management in Agriculture - Part II
Sept 20   Pesticide Policy: Key Laws & Regulations
Sept 22   Tradeoffs: Public Health, Environmental Health, and Productivity

II. LIVESTOCK SYSTEMS

Sept 27   Principles of Livestock Production
Sept 29   Conventional Livestock; Government Interactions with Livestock Industry
Oct 4   Grazing Livestock: Local to Global
Oct 11   People in the Livestock Sector
Oct 13   Antimicrobials in Livestock Production
Oct 18   Alternative Livestock Production Systems: Ben Gotschall, Wolfe's Neck Center
Oct 20   In-Class Livestock Model - working day

III. FOOD FROM WATER

Oct 25   Introduction to Fisheries: Adrian Jordaan, Univ. of Massachusetts
Oct 27   Aquaculture: Solution or Problem
Nov 1   Linking to Fisheries – Example from Madagascar: Chris Golden T.H. Chan
           School of Public health, Harvard
Nov 3   Human Dimension of Fisheries: Jessica Sparks, Friedman School
Nov 10   The Seafood Paradox - Discussion
Nov 15   Topic TBD !! (Suggestions are welcomed)

IV. LAND SPARING

Nov 17   Intensification vs. Extensification; Concept of Sustainable Intensification
Nov 22   Land-Sparing Strategies and Applications
Nov 24   NO CLASS THANKSGIVING
Nov 29   Pathways and Impacts for Higher Yields
Dec 1   Food Waste Reduction – A Resource Sparing Option
Dec 6   Impacts and Policies for Dietary Change for Sustainability
Dec 8   Screening of Stories

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Course Assignments & Grading

The assignments and their due dates and contribution to your final grade are as follows:

Assignment	Due Date	Proportion of Grade
Persuasive Writing: Op-Ed on Pesticides	September 30	25%
Modeling: Livestock Feed Demand/Land Use	October 25	25%
Policy Memo: Antimicrobials in Livestock	November 15	25%
Video: Flashpoints in Fisheries	December 8	20%
Participation	Continuous	5%

The graded assignments for the course are summarized below and in detail on the course Canvas site.   There will also be a small number (probably two) online reflections on emerging topics during the semester – these will be ungraded.

Persuasive Writing: Op-Ed on Pesticides: You want touse your expertise to sway public opinion, and you have decided that the Op-Ed page of the New York Times is the ideal venue. Your task is propose specific action on one of two controversial and widely used pesticides - glyphosate (a weed killer) or neonicitinoids (a family of insecticidal chemicals).

Quantitative Assessment: Livestock Feed Requirements and Land Use: Dairy production will be the focus of the assignment. You will enumerate the number of dairy animals in the region, determine the amount of feed crops needed to support those animals, and compare the amount needed to the amount grown. Once you have completed your analysis, you will submit your results in the form of a fully documented table, akin to what would be produced in a scientific paper, a government report, or a formal report from a non-governmental organization.

Policy Development: Antimicrobials in Livestock Production: Antimicrobials, which includes antibiotics and other compounds, are widely used in producing livestock animals in the U.S. There are multiple outcomes from their use, including faster growth, greater feed efficiency, antibiotic residues, and accelerated antimicrobial resistance. You will write policy memo to either USDA or FDA that presents evidence on one of these outcomes, and proposes a concrete policy solution or refinement.

Video: Flashpoints in Fisheries: Details to follow!

Participation: Having the participation from everyone in the room (including our various guests) is **essential**.   We are a small enough group (and spent the spring semester together in ASP I) that all opinions and experiences are welcome, and I will call on you individually in class. Additionally, each of you will provide a succinct summary of at least one reading or exhibit, at the beginning of a class session (details to follow).