

PSE 105 — PRINCIPLES AND PRACTICES OF SUSTAINABLE AGRICULTURE

PSE 105-0001 (65834)

3 Credits

Fall, 2017

Tuesday & Thursday, 8:00 to 9:15

Little Hall 140

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Course Description

Principles and Practices of Sustainable Agriculture will provide students with an overview of important world cropping systems, identifying critical features within these systems that lead to questions regarding their ability to sustain the local or regional environments and communities they affect. Students will then be introduced to the principles and practices common to systems that operate with greater reliance on ecological processes than on purchased inputs. Lastly, students will explore the challenges, constraints, and successes in the operation and transition to sustainable production practices.

Students will critically evaluate modern industrial agricultural systems, using data on environmental, social and economic indicators to critique the underlying food system and predominate production practices. Through analysis of natural systems, traditional farming systems, and alternative farming systems, students will identify indicators of sustainability and the practices that contribute to the sustained function of these systems. Students will study case examples of alternative farming systems to develop a synthetic understanding of the interacting principles and practices of sustainable agricultural systems.

Satisfies General Education requirements for Population & the Environment and the Sciences (Application of Scientific Knowledge).

Learning Outcomes

1. Explain crop and livestock production in our current food system.
2. Describe the successes and failures of agricultural production practices from the perspective of farmers, consumers and the environment.
3. Locate and assess information on agricultural production practices and impacts on the environment and human health.
4. Use ethical approaches to the analysis of the food system.
5. Explain their own personal values in relation to the food system.
6. Make predictions about future trends in agricultural production, consumers' role in agriculture, and environmental stewardship of producers.
7. Recommend policy or a course of action in response to problems with the food system.

Course Schedule (subject to minor revision)

lec no.	Date 2017	Topic	Reading(s) to be completed <u>before</u> class
1	8/29	<u>Introduction</u>	<ul style="list-style-type: none"> • 01 Reganold et al. (1990). Sustainable agriculture.
2	8/31	A Brief History of Agriculture	<ul style="list-style-type: none"> • 02 Dimitri et al. (2005). The 20th Century Transformation of U.S. Agriculture and Farm Policy.
3	9/5	<u>The Modern Food System</u> King Corn (video)	<ul style="list-style-type: none"> • 03 Pollan (2006). Our national eating disorder, and King corn. From An Omnivore's Dilemma.
4	9/7	Industrial Agriculture	<ul style="list-style-type: none"> • 04 Avery (2000). Saving the Planet with Pesticides and Plastic. (excerpt)
5	9/12	My Father's Garden (video)	<ul style="list-style-type: none"> • 05 Alavanja et al. (2013). Increased cancer burden among pesticide applicators and others due to pesticide exposure.
6	9/14	Pesticides	<ul style="list-style-type: none"> • 06 Bourguet and Guillemaud (2016). The hidden and external costs of pesticide use.
7	9/19	Animal Production	<ul style="list-style-type: none"> • 07 Weis (2013). Ecological Hoofprint. Chapter 1.
8	9/21	Food Waste	<ul style="list-style-type: none"> • 08 Costello et al. (2015). Food waste in campus dining operations.
9	9/26	Small-scale Farming Practices (field trip to UMaine Greens)	<ul style="list-style-type: none"> • 09 Fortier (2014). Preface and Chapter 1 from The Market Gardener.
10	9/28	Exam 1	
11	10/3	<u>Designing Sustainable Agriculture Systems</u> — Nature & Traditional Ag. as Models — Cuba	<ul style="list-style-type: none"> • 11 King (1911). Farmers of Forty Centuries.

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12	10/5	<u>Principle 1: Maintain/Improve Soil Quality</u> – Soils, Soil Quality & Fertility	<ul style="list-style-type: none"> • 12 Gliessman (1998). Soil.
	10/10	Fall Break—no class	
13	10/12	– Conservation Agriculture	<ul style="list-style-type: none"> • 13 Palm et al. (2014). Conservation agriculture and ecosystem services: An overview.
14	10/17	– Cover Cropping (Margaret Pickoff)	<ul style="list-style-type: none"> • 14 Schipanski (2014). A framework for evaluating ecosystem services provided by cover crops in agroecosystems.
15	10/19	<u>Principle 2: Diversification in Time & Space</u> – Crop Rotation, Intercropping & Agroforestry	<ul style="list-style-type: none"> • 15 Kremen and Miles (2012). Ecosystem services in biologically diversified versus conventional farming systems: Benefits, externalities, and trade-offs.
16	10/24	– no class	<ul style="list-style-type: none"> • No reading.
17	10/26	– Genetic Diversity of Crops & Livestock	<ul style="list-style-type: none"> • 17 Pautasso et al. (2013). Seed exchange networks for agrobiodiversity conservation. A review.
18	10/31	– Re-integration of Crops & Livestock (Margaret McCollough)	<ul style="list-style-type: none"> • 18 Hilimire (2011). Integrated Crop/Livestock Agriculture in the United States: A Review
19	11/2	<u>Principle 3: Ecologically Based Pest Management</u> – Weeds	<ul style="list-style-type: none"> • 19 Gallandt (2014). Weed management in organic farming.
20	11/7	– Insect Pests	<ul style="list-style-type: none"> • 20 Zehnder et al. (2007). Arthropod pest management in organic crops
21	11/9	Exam 2	
22	11/14	<u>Alternative Agriculture</u> Organic Farming	<ul style="list-style-type: none"> • 22 Badgley et al. (2007). Organic agriculture and the global food supply.
23	11/16	Biodynamic Farming	<ul style="list-style-type: none"> • 23 Paull (2011). Biodynamic agriculture: The journey from Koberwitz to the world, 1924-1938.
24	11/21	Permaculture	<ul style="list-style-type: none"> • 24 Ferguson and Lovell (2014). Permaculture for agroecology: design, movement, practice and worldview.
	11/23	Thanksgiving Break—no class	

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25	11/28	<u>The Future of Agriculture</u> Urban Farming	<ul style="list-style-type: none"> 25 Ackerman et al. (2014). Sustainable food systems for future cities: The potential of urban agriculture.
26	11/30	Climate Change and Agriculture	<ul style="list-style-type: none"> 26 Hatfield and Tackle (2014) Climate change impacts in the United States, Chapter 6, Agriculture
27	12/5	The Farm Bill: The role of the State in facilitating a sustainable agriculture	<ul style="list-style-type: none"> 27 USDA 2014 Farm Bill Highlights
28	12/7	The Local Food System	<ul style="list-style-type: none"> 28 Schnell (2013). Food miles, local eating, and community supported agriculture: putting local food in its place.
	12/12	Exam 3: 12:15 to 2:15 (LH140)	

Required Text

None. Assigned readings are available as pdf files through the course Blackboard site.

Blackboard

All course materials, including assigned readings, lecture handouts, copies of slides presented in lecture, and homework assignments are available through the PSE 105 Fall 2017 Blackboard site. Please visit the IT Help Center if you need assistance navigating Blackboard, uploading homework assignments, or logging in.

Grading

Attendance and brief questions on assigned readings (in-class, cards)	50 points
Exams (3 @100 points)	300 points
Homework Papers (2 @ 50 points)	100 points

Exams will consist of Key Words and Questions derived from both lecture material and assigned readings. These will include definitions of terms, short answers (noted as Key Words in the Lecture Outlines), and brief essays. Lecture Outlines will also include essay questions; a subset of these will appear on the exams. Homework Assignments with detailed instructions will be posted on Blackboard and must be submitted to Blackboard.

Final Grades

A	96-100	B+	87-89	C+	77-79	D+	66-69
A-	90-95	B	83-86	C	73-76	D	60-65
		B-	80-82	C-	70-72		

Policies

Make-up exams

Make-up exams will not be offered without prior approval. Homework papers will not be accepted after assigned deadlines.

Academic Honesty Statement

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students Accessibility Statement

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581-2319, as early as possible in the term.

Course Schedule Disclaimer (Disruption Clause)

In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination involving members of the campus, your teacher is required to report this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

- For confidential resources on campus: Counseling Center: 207-581-1392 or Cutler Health Center: at 207-581-4000.
- For confidential resources off campus: Rape Response Services: 1-800-310-0000 or Spruce Run: 1-800-863-9909.
- Other resources: The resources listed below can offer support but may have to report the incident to others who can help:
 - For support services on campus: Office of Sexual Assault & Violence Prevention: 207-581-1406
 - Office of Community Standards: 207-581-1409
 - University of Maine Police: 207-581-4040 or 911
 - See the OSAVP website for a complete list of services at <http://www.umaine.edu/osavp/>