



SENATE COMMITTEE ON CURRICULAR AFFAIRS
COURSE SUBMISSION AND CONSULTATION FORM

Principal Faculty Member(s) Proposing Course

Name	User ID	College	Department
Heather D Karsten	hdk3	Agricultural Sciences (AG)	Not Available

Academic Home: Agricultural Sciences (AG)

Type of Proposal: Add Change Drop

Current Bulletin Listing

Abbreviation: **AGECO**

Number: **134**

I am requesting recertification of this course for the new Gen Ed and/or University Requirements Guidelines

This proposal is for prerequisite enforcement.

Message for Reviewers:

Course Designation

(AGECO 134N) Sustainable Agriculture Science and Policy

Course Information

Cross-Listed Courses:

Prerequisites:

RSOC will be dropped as cross-listing and dropped from the course catalog

Corequisites:

Concurrents:

Recommended Preparations:

Abbreviated Title: Sustainag Sci & Poli

Discipline: General Education

Course Listing: Inter-Domain

Special categories for Undergraduate (001-499) courses

Foundations

Writing/Speaking (GWS)

Quantification (GQ)

Knowledge Domains

Health & Wellness (GHW)

Natural Sciences (GN)

Arts (GA)

Humanities (GH)

Social and Behavioral Sciences (GS)

Additional Designations

Bachelor of Arts

International Cultures (IL)

- United States Cultures (US)
- Honors Course
- Common course number - x94, x95, x96, x97, x99
- Writing Across the Curriculum

First-Year Engagement Program

- First-Year Seminar

Miscellaneous

- Common Course

GE Learning Objectives

- GenEd Learning Objective: Effective Communication
- GenEd Learning Objective: Creative Thinking
- GenEd Learning Objective: Crit & Analytical Think
- GenEd Learning Objective: Global Learning
- GenEd Learning Objective: Integrative Thinking
- GenEd Learning Objective: Key Literacies
- GenEd Learning Objective: Soc Resp & Ethic Reason

Bulletin Listing

Minimum Credits:	3
Maximum Credits:	3
Repeatable:	NO
Department with Curricular Responsibility:	Plant Science (UPAG_PLTSC)
Effective Semester:	After approval, the Faculty Senate will notify proposers of the effective date for this course change. Please be aware that the course change may not be effective until between 12 to 18 months following approval.
Travel Component:	NO

Course Outline

A brief outline or overview of the course content:

This course combines the study of agricultural science with an introduction to public policymaking and overview of socio-economic issues as they relate to agriculture and food primarily in U.S. agriculture. Through examples and case studies, students examine the contributions of both science and policy that are crucial to make the food and agricultural system more sustainable. By developing students' ability to think critically about the sustainability challenges facing contemporary agriculture and possible solutions, the course prepares students for engaged and informed citizenship. It also provides a practical, interdisciplinary introduction to the food and agricultural system that will support students considering careers in the agricultural, food or environmental sciences, non-profit or public policy organizations, or in agribusiness.

A listing of the major topics to be covered with an approximate length of time allotted for their discussion:

The course meets for 75 minutes (1 class) twice a week. Unless otherwise indicated, the course examines each of following topics in one 75-minute class with readings and materials that students are assigned to read prior to class:

1. Introduction to the Course, Students, Instructors, and Sustainable Agriculture
2. Modernization and Industrialization of Agriculture: consequences for sustainability and challenges for the future
3. History of US Farm Transitions – Intro. of socioeconomic issues & US farm policies
4. Transitions in the Agricultural and Food System: Specialization, Consolidation, and Vertical Integration
5. Introduction to Soils, soil health, soil fertility and conservation (3 classes)
6. Introduction to Crop Science and Crop and Soil Management for Sustainability (3 classes)
7. Integrated Pest Management and Pest Management Technologies (3 classes)
8. Introduction to Public Policy and the Policy making process (2 classes)
9. The role of Interest Groups in Policymaking process and Agricultural-Food System Interest Groups
10. US Farm Policy Overview
11. US Dust Bowl Case Study
12. US Conservation Agricultural Policies
13. Analysis of US Agricultural Commodity Policies: Interest Groups Influence and Implications for the Agri-food system and Environment
14. Mississippi River Watershed Case Study
15. Chesapeake Bay Watershed Science
16. Chesapeake Bay Water Quality Policy Case Study
17. Introduction to Current Policy perspectives and context for Proposed Policy for Interest Group Project and Mock Congressional Testimony: Farm Bill, Agriculture and Public Health (2 classes)

18. Interest Group Project Development and Feedback
19. Interest Group Testimonies in a Mock Congressional Agricultural Policy Hearing
20. USDA Certified Organic Agriculture and Policy (2 classes)
21. Marketing Strategies to support Sustainable Agriculture
22. Analysis of Agricultural Science, Policy and Market Needs and Opportunities to promote Sustainable Agriculture

Course Description:

This inter-domain (GN/GS) general education course addresses the science, socio-economics, and politics of managing food and fiber production systems; and the sustainability implications of current practices and future options. The course will teach students about the soil, plant, animal, and ecological sciences; technologies, socio-economic implications, and policies of our agroecosystems in an integrated manner. We will examine agricultural scientific, agricultural policy, and economic opportunities to enhance the sustainability of agriculture for food and fiber production. Students will have many opportunities to examine and critically analyze scientific knowledge and policies during discussions, writing exercises, and role playing to develop analytical and communication skills. There are no prerequisites for this course. This course can link with other courses that address how research and efforts in agricultural sciences, ecology, policy, economics, philosophy, education, and communication influence sustainable management of natural resources for the present and the future.

The name(s) of the faculty member(s) responsible for the development of the course:

Name: Heather D Karsten (hdk3)

Title:

Phone:

Address:

Campus: UP

City:

Fax:

Course Justification

Instructional, Educational, and Course Objectives:

This section should define what the student is expected to learn and what skills the student will develop.

By the end of this course, students will be able to—

- Discuss key issues in critiques of the sustainability of US agriculture;
- Specify and justify their own definition of sustainable agriculture;
- Apply both agricultural science and social science principles and concepts in assessing historical and current sustainability problems of the food and agricultural system;
- Identify agriculture's diverse interest groups and explain their concerns and roles in the agricultural policymaking process;
- Evaluate the intended and unintended consequences of specific farm and agricultural policies.

Evaluation Methods:

Include a statement that explains how the achievement of the educational objective identified above will be assessed.

The procedures for determining students' grades should be specifically identified.

Online quizzes based on the readings assigned prior to each class (16%)

In-class activities (14 individual or small group writing and discussion activities during class, 10%)

In-class group quizzes. (2 or 3 per semester) In groups of 3 students, students discuss and develop their best answer to short answer and matching questions about one or two assigned readings. Students earn up to 10 of 25 points for the assessment based on their individuals' notes on the assigned reading that they are encouraged to prepare prior to the group quiz (12%)

Interest Group, group assignment. In groups of 4, students research and write a profile of an agricultural and food system interest group. All groups are presented with a proposed agricultural policy, and they then predict their interest group's position on the proposed agricultural policy, and prepare, role play and present an oral testimony of the interest group during a Mock Congressional Testimony (22%)

Independent tests (18%) two, independent tests cover 1/3 of the course material

Final exam (22%) that emphasizes the last third of the course, but also assess student understanding of the key course agricultural science and policy concepts.

Relationship/Linkage of Course to Other Courses:

This statement should relate the course to existing or proposed new courses. It should provide a rationale for the level of instruction, for any prerequisites that may be specified, or for the course's role as a prerequisite for other courses.

This course does not link to other courses.

Relationship of Course to Major, Option, Minor, or General Education:

This statement should explain how the course will contribute to the major, option, or minor and indicate how it may function as a service course for other departments.

The course is an elective for students in the Plant Science and Agricultural Science majors and is already classified as GN.

A description of any special facilities:

The course requires a lecture room with a digital projector, the use of a University bus for two or three class fieldtrips to visit the PSU Agronomy research farm, and typically the PSU student farm and/or a nearby commercial farm.

Frequency of Offering and Enrollment:

Fall semester of each year.

Justification for Changing The Proposal:

Include a justification for each change to the course. Particular attention should be paid to the effects of the course change within the discipline and in other disciplines where the course may be required within a major or used as a service course. When a unit submits several course changes, with or without new course proposals, a general statement covering the programmatic effects of the changes should be submitted.

This is a recertification of the course for general education and request for certifying the course as an Inter-Domain, GN and GS course. The course was originally developed and taught as a GN/GS course with funding from Kellogg Foundation grant in 1999 by an Agroecologist (Dr. Heather Karsten, Dept. of Plant Science) and Political Scientist (Dr. Robert O'Connor, Dept. of Political Science) . When Dr. O'Connor left Penn State, Dr. James Eisenstein, (Dept. Political Scientist) co-taught the course, and when he retired, it was co-taught with Dr. Clare Hinrichs a Rural Sociologist for a number of years. The interdisciplinary and social science elements of the course have remained, and the instructor keeps the course materials current and updates both the agricultural science content as well as the agricultural policy and the socio-economic content. The social science information for instance is kept current with information about each new Farm Bill, Chesapeake Bay water quality EPA policy, and from sources such as the USDA Economic Research Service reports, and Anti-Trust Division of the Dept. of Justice.

Alignment with General Education Objectives

EFFECTIVE COMMUNICATION – the ability to exchange information and ideas in oral, written, and visual form in ways that allow for informed and persuasive discourse that builds trust and respect among those engaged in that exchange, and helps create environments where creative ideas and problem-solving flourish.

KEY LITERACIES – the ability to identify, interpret, create, communicate and compute using materials in a variety of media and contexts. Literacy acquired in multiple areas, such as textual, quantitative, information/technology, health, intercultural, historical, aesthetic, linguistic (world languages), and scientific, enables individuals to achieve their goals, to develop their knowledge and potential, to lead healthy and productive lives, and to participate fully in their community and wider society.

CRITICAL AND ANALYTICAL THINKING – the habit of mind characterized by comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating a conclusion. It is the intellectually disciplined process of conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.

INTEGRATIVE THINKING – the ability to synthesize knowledge across multiple domains, modes of inquiry, historical periods, and perspectives, as well as the ability to identify linkages between existing knowledge and new information. Individuals who engage in integrative thinking are able to transfer knowledge within and beyond their current contexts.

CREATIVE THINKING – the capacity to synthesize existing ideas, images, or expertise in original ways and the experience of performing, making, thinking, or acting in an imaginative way that may be characterized by innovation, divergent thinking, and intellectual risk taking.

GLOBAL LEARNING – the intellectually disciplined abilities to analyze similarities and differences among cultures; evaluate natural, physical, social, cultural, historical, and economic legacies and hierarchies; and engage as community members and leaders who will continue to deal with the intricacies of an ever-changing world. Individuals should acquire the ability to analyze power; identify and critique interdependent global, regional, and local cultures and systems; and evaluate the implications for people's lives.

SOCIAL RESPONSIBILITY AND ETHICAL REASONING – the ability to assess one's own values within the social context of problems, recognize ethical issues in a variety of settings, describe how different perspectives might be applied to ethical dilemmas, and consider the ramifications of alternative actions. Individuals should acquire the self-knowledge and leadership skills needed to play a role in creating and maintaining healthy, civil, safe, and thriving communities.

What component(s) of the course will help students achieve the General Education Learning Objectives covered in the course? Provide evidence that students in the course have adequate opportunities to achieve the identified learning objectives.

Effective Communication

During class in pairs or small groups, students examine and discuss 14 in-class activities. They share their responses both verbally in class and as a written response. They also practice oral and written communication during two small group quizzes when they must discuss their understanding of assigned readings with their group members and write responses to group quiz questions. They also submit their independent notes on the assigned article that they are permitted to use during the group quiz discussions without the original article. Finally, in the interest group project, groups of 3 or 4 students have the opportunity to develop their oral and written communication skills when they work together to prepare a 5-10 page written interest group research and analysis project, and through verbal testimony during a Mock Congressional testimony.

Critical and analytical thinking

Throughout the course students are asked to consider different perspectives and ways of interpreting the impacts of agricultural policy on various aspects of agricultural sustainability. Students practice critical and analytical thinking with data and case studies examples through 14 in-class small group activities during class. After working independently, the class discussed the data or case studies and considers different perspectives and interpretations of the information. Group quizzes also offer students the opportunity to critically analyze and interpret assigned readings with peers, and the interest group project provides the opportunity for students to think critically and analytically to determine their interest group's political position and activity in response to a mock proposed policy.

Integrative Thinking

As an interdisciplinary course, students are introduced to both the agricultural sciences, some of the socio-economic consequences of modern intensive agriculture and US policies. They are also introduced to the policy-making process and how the policy-making process and current agricultural policies influence farming decisions, agribusiness decisions, and the agriculture and the food system. Through case studies both historical and current, students examine these issues from multiple disciplinary and societal perspectives to develop a multi-faceted understanding of the history of agricultural intensification and policy, the current state of agriculture, and opportunities to enhance agricultural sustainability. In addition, students are encouraged to develop their own criteria and definition of sustainable agriculture and pathways to more sustainable agriculture.

How will students be assessed to determine their attainment of the Learning Objective(s) of General Education covered in this course? This assessment must be included as a portion of the student's overall performance in this course.

Effective Communication

Students oral communication skills are assessed through their participation in class discussions and oral testimony in a mock Congressional testimony. The two group quizzes and interest group project also indirectly assesses how well students communicate their ideas with their group members. Their written communication is assessed through their written 14 group activities, short answers on two group quizzes, accompanying notes on the assigned readings for the group quizzes, and one written 5-10 page interest group project.

Critical and analytical thinking

Prior to two group quizzes, students must read and think critically about the assigned article(s) in light of the course themes. In class they then discuss the readings with their group to answer the quiz questions. Students' critical and analytical thinking about the course material is also assessed in the two independent quizzes and final exam. In the interest group project, students must critically analyze their interest group (their membership, values, mission statement, and underlying agenda) to determine what position the interest group would take regarding a proposed policy. They also research how the interest group is politically active and predict how politically active the interest group would be in response to the proposed policy.

Integrative Thinking

The two group quizzes, two independent tests, final exam, and the Interest Group project and Mock Congressional Testimony assess students ability to employ integrative thinking to examine multiple disciplinary and political perspectives of agricultural sustainability of case studies, agricultural issues and policies.

General Education Domain Criteria

General Education Designation: Inter-Domain

GN Criteria

- Explain the methods of inquiry in the natural science fields and describe how the contributions of these fields complement inquiry in other areas
- Construct evidence-based explanations of natural phenomena
- Demonstrate informed understandings of scientific claims and their applications
- Evaluate the quality of the data, methods, and inferences used to generate scientific knowledge
- Identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems

What components of the course will help students achieve the domain criteria selected above?

Construct evidence-based explanations of natural phenomena:

This course uses foundational scientific understanding of agroecology including soil science, crop science, entomology and ecology to examine and understand agricultural systems and the opportunities to enhance agricultural sustainability. Through readings, class discussions and assignments students learn the scientific basis of for instance, increased agricultural crop and animal productivity, nutrient cycling, soil conservation, water quality terrestrial aquatic ecology, and insect and weed population dynamics.

Demonstrate informed understandings of scientific claims and their applications

The course examines the scientific research and application of multiple scientific disciplines to agricultural management and technologies such as inorganic fertilizers, agricultural mechanization, soil conservation, genetic improvement of crop varieties, genetically engineered crops for pest management, and other pest management technologies. Students engage in critical and analytical thinking to understand the science through course readings, field trips, videos, in-class activities and discussions.

Identify societal or philosophical implications of discoveries in the natural sciences, as well as their potential to address contemporary problems.

The course explores the implications of agricultural science in the development of modern intensified agriculture for agricultural productivity, food security, and agroecosystem and natural ecosystem sustainability. Through historical and current case studies the course explores both the positive and negative consequences of the application of multiple scientific disciplines to agriculture and offers students to engage in both critical and analytical thinking as well as integrative thinking. Examples topics include: the Green Revolution and increased agricultural productivity and food security, the loss of crop plant biodiversity, the US Dust bowl, eutrophication of watersheds, and the evolution of pest resistance to pesticides. In particular, the course explores how enhanced scientific understanding consequences of some agricultural practices has led to additional scientific research that offer potential opportunities to enhance agricultural sustainability through technologies and practices such as conservation tillage and cropping systems, soil health, nutrient management, integrated pest management, and organic agriculture.

GS Criteria

- Explain the various methods of inquiry used in the social and behavioral sciences and describe how the contributions of these fields complement inquiry in other areas
- Identify and explain major foundational theories and bodies of work in a particular area of social and behavioral

sciences

- Describe the ways in which many different factors may interact to influence behaviors and/or institutions in historical or contemporary settings
- Explain how social and behavioral science researchers use concepts, theoretical models and data to better understand and address world problems
- Recognize social, cultural, political and/or ethical implications of work in the social and behavioral sciences

What components of the course will help students achieve the domain criteria selected above?

Identify and explain major foundational theories and bodies of work in a particular area of social and behavioral sciences. Through political science course readings, in-class activities and discussions and quizzes, students are introduced to foundational theories of public policy and the policy-making process. The course examines agricultural policies as case studies, and students engage in critical and analytical thinking and develop communication skills in public policy through an interest group research project and a Mock Congressional testimony. In addition, the course introduces some foundational theories in economics (such as economies of scale) and rural sociology to understand economic and social impacts of industrialized agriculture, such as economies of scale, consolidation and specialization; and social impacts of transformations of the agricultural economy on farming communities, food security, and the agri-business and food system supply chains.

Describe the ways in which many different factors may interact to influence behaviors and/or institutions in historical or contemporary settings

The course examines the economic, social and political factors that contribute to government policy development, as well as the multiple participants in the policy-making process, including elected policy-makers, farmers, business and other interest groups, citizens, and government bureaucrats. Through course readings, in-class activities, videos and case studies, the interest group project, and the Mock Congressional testimony students examine the historical evolution of US agricultural government policies and the factors and participants who have contributed to their development. Agricultural policies that are examined include for example agricultural commodity policy, resource conservation (soil, water, biodiversity, energy), nutrient regulations and water quality protection policies, and the development of the US certified organic agriculture standards. Students engage in critical and integrative thinking to understand how the agricultural natural science disciplines, as well as the social sciences (economic and public policy) have contributed to the development of the agricultural government policies and the organization of private sector organization and structure of farms, agribusiness and food supply systems.

Recognize social, cultural, political and/or ethical implications of work in the social and behavioral sciences.

This course introduces political and economic factors that have contributed to the industrialization of agriculture, and how these disciplines as well as sociology have contributed to the understanding of impacts of modern intensified agriculture on food security, farming communities, the agribusiness and food supply chain, and agroecosystem sustainability. The course highlights how work in the social sciences in both the public and private sector are critical to contributing to enhancing agricultural sustainability. Students are encouraged to engage in integrative thinking to examine how agricultural policies, economic strategies, and public and private sector institutions enhance agricultural and food system sustainability. Course readings, in-class activities, case studies, the interest group project and Mock Congressional testimony. They are also encouraged to identify new opportunities for people trained in the social sciences to contribute to advancing sustainable agriculture and food systems.

Integrative Studies

Explain how the intellectual frameworks and methodologies of the two Knowledge Domains will be explicitly addressed in the course and practiced by the students.

This is an interdisciplinary course that introduces students to the scientific principles and some methods for studying agronomy, soil science, and agroecology to understand the development and impact of agricultural technologies and practices as well as scientific research and opportunities to promote sustainable agriculture. These concepts are explored through case studies, course readings, fieldtrips, and analysis of data during in-class activities. In addition, students are introduced to political science concepts and principles of public policy and the policy-making process as well as agricultural economic and rural sociology principles and metrics that are used to understand the evolution of the US agricultural economy, farming community demographics and agribusiness and food system re-organization and structure. These social science frameworks and metrics are explored through course readings from political science texts, class lectures with current data from the USDA ERS reports, in-class activities, case studies, the interest group project and Mock Congressional testimony.

Demonstrate that each of the two domains will receive approximately equal attention, providing evidence from course topics, assignments, or other course components, and that students will integrate material from both domains.

As indicated in the syllabus outline, ten classes and supporting course readings, in-class activities and quizzes are devoted to introducing students to the agroecological sciences (Soil science, Crop science and ecology, Pest management and ecology, Watershed science) and ten classes and the accompanying course readings and in-class activities and quizzes focus on political science and socio-economic analysis of the evolution of US farming and Agri-business and Food systems. (ex. US farm transitions & history, Intro. to Public Policy and the Policy-making process, Role of interest groups in the policy-making process, US Farm Policies: Farm Bill, History of Conservation Agricultural Policies, Analysis of US Agricultural Commodity Policies, Chesapeake Bay Water Quality Policy).

During the other ten classes the course examines and analyzes the history and the current state of the US agricultural and food system from an interdisciplinary perspective. Through examples and case studies such as the US Dust Bowl, Chesapeake Bay Water Quality, the USDA Certified Organic Agriculture Science and Policy, the Interest Group Project and Mock Congressional Testimony, Market Strategies to support Sustainable Agriculture, and the final class, the course examines how the development of a more sustainable agriculture and food system cannot be achieved through science and technology alone, nor policy alone, nor economic-market approaches alone. As with many societal issues, an integrated approach is required which provides an opportunity for people from multiple disciplines to contribute to designing a more sustainable agriculture and food system. In addition, the course offers the opportunity for students to learn and interact with peers from multiple disciplines and expose them to multiple perspectives to enhance their understanding of the issues, and develop their critical and analytical thinking and interdisciplinary communication skills through group quizzes and the interest group project and Mock Congressional Testimony to

prepare students to work on interdisciplinary issues in the future.

Briefly explain the staffing plan. Given that each Inter-Domain course is approved for two Knowledge Domains, it will be taught by an instructor (or instructional team) with appropriate expertise in both domains.

This interdisciplinary course was originally developed as a cross-listed GN/GS course by an Agroecologist and Political Scientist with funding from a Kellogg Foundation grant, in 1999. For the first ten years, the course was team-taught by an Agroecologist and two different Political Scientists, (one left PSU and the second retired), and then a Rural Sociologist. When there was no longer a social scientist available to team-teach the course, the Agroecologist continued to use the information from the previous social science course contributors to teach and update the course materials (both natural science and social science materials) for approximately the past 10 years. Social scientists are often invited to guest lecture in the course.

Describe the assessments that will be used to determine students' ability to apply integrative thinking.

The 14 in-class activities requires students to consider and integrate multiple disciplinary perspectives of example data and case studies with their peers during class. Two group quizzes require students to take notes prior to class and in-class discuss and develop group answers to a group quiz based where they consider how multiple factors (scientific knowledge and technology, policies and economic and social values) have contributed to either degrading (ex. historical analysis of Dust Bowl) or offer opportunities to enhance agricultural productivity and sustainability.

Students also work in interdisciplinary teams on an Interest Group project and participate in a Mock Congressional Testimony. The project requires students to research an interest group, analyze and determine the interest group's political position and activity in response to hypothetical proposed policy. This assessment requires students to integrate scientific, economic, social and political factors and the implications of the proposed policy for their interest group. During and after the Mock Congressional Testimony students hear from, reflect on, and discuss the implications of the diverse perspectives of interest groups on the agricultural policy-marking process.

Campuses That Have Offered (AGECO 134) Over The Past 4 Years

semester	AB	AL	BK	BR	BW	CR	DS	ER	FE	GA	GV	HB	HN	HY	LV	MA	NK	PC	SH	SL	UP	WB	WC	WS	XC	XP	XS	YK
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Potential Impact

Pre-Requisites

AGECO 134 is *listed as a pre-requisite or concurrent course* for the following courses:

Note: Not all courses may be listed here, due to lionpath requirement incompleion.

No pre-requisites or concurrent courses found

Sustainable Agriculture Science and Policy AGECO 134, Fall 2017

Instructor: Dr. Heather Karsten, Dept. Plant Science

251 Agricultural Sciences and Industries Building, hdk3@psu.edu

863-3179, Office hours: Thursdays:10:30 am - 12:00 pm or by appointment

Teaching Assistant: Jonathan Binder M.S. student in Agronomy, Dept. of Plant Science

206 Agricultural Sciences and Industries Building, jmb1083psu.edu

814-203-0035, Office hours: Mondays: 12:30 pm – 2:00 pm or by appointment

Class Meets: Tues. & Thurs 9:05 – 10:20; 5 Ferguson Building

Course Description:

What is meant when we speak of “sustainable agriculture”? What is most important to sustain agriculture? How does scientific knowledge about sustainability in agriculture influence agricultural policymaking and implementation? Why is some scientific knowledge sometimes minimized, misused or even ignored? This course combines study of agricultural science with a broad overview of socio-economic issues and public policymaking, as they relate to agriculture, food and farming primarily in U.S. agriculture. Overall, the course stresses that the contributions of both science and policy are crucial in efforts to make the food and agricultural system more sustainable. By developing students’ ability to think more critically about the sustainability challenges facing contemporary agriculture and to evaluate possible solutions, this course prepares students for more engaged and informed citizenship. The course also provides a practical, interdisciplinary introduction to the food and agricultural system that will support students considering careers in the agricultural or environmental sciences, in non-profit or public policy organizations, or in agri-business.

Course Objectives:

By the end of this course, students will be able to—

- Identify key issues in debates about the sustainability of agriculture;
- Specify and justify their own definition of sustainable agriculture;
- Apply both agricultural science and social science principles and concepts in assessing historical and current problems of the food and agricultural system;
- Identify agriculture’s diverse interest groups and explain their roles and concerns in the agricultural policymaking process;
- Evaluate the intended and unintended consequences of specific farm and agricultural policies.

Course Materials:

This is an interdisciplinary course with readings from multiple sources. Rather than suggest that you purchase multiple books, selected readings from diverse sources have been placed either on the library’s Electronic Reserves under AGECO 134 (libraries.psu.edu), or are available on the internet and are indicated in the syllabus with Web URL’s. Some of the issues and topics we will study are likely to generate news articles reporting the latest developments. Therefore, we will occasionally assign supplemental articles and editorials from the *New York Times* to link class content to “real world” outcomes and policy. You can get the *New York Times* from one of the newspaper boxes on campus using your student ID.

Course Expectations and Approach:

In considering the connections between science and policy and their combined effect on sustainable agriculture, this course emphasizes **critical thinking**. Critical thinking involves:

1. Raising vital questions and problems and formulating them clearly;
2. Gathering and assessing relevant information, using well-reasoned criteria and standards to evaluate such information;
3. Considering alternative systems of thought with an open mind, remaining attuned to their assumptions, implications and practical consequences; and
4. Communicating effectively with others to determine solutions to complex problems.¹

We will introduce you to various new concepts, which will be useful tools in thinking more critically about the subject of this course. We recommend you keep a running list of course concepts and record your emerging thinking about them. We particularly encourage you to record your thoughts about that challenges and key elements of sustainable agriculture

The class format will include instructor lectures, guest presentations, in-class activities, two field trips, videos, small-group activities and projects, and class discussion. In lectures, we will elaborate key issues, present background and related material, and pose questions to guide our in-class activities and discussions. Lectures cannot provide a substitute for you completing the assigned readings and you will need to keep up with the readings to participate actively in class and maximize your learning. To ensure that you do keep up, there are regular reading question exercises that you will complete on our CANVAS course site (go to <https://canvas.psu.edu>). These reading questions are a few short questions about class readings marked in the syllabus with “RQ.” **To get credit, reading questions must be completed on-line prior to the class they are listed on the syllabus, and those readings will be discussed in class.** There are more than 75 points possible in the Reading Questions. So, if you select some incorrect answers or miss completing an online set of questions, you can still earn full credit by answering some other reading questions correctly. If you answer more than 75 points correctly, you will earn some extra credit.

You will be evaluated in this course in a variety of ways, drawing on both individual and collaborative work. These include:

- ◇ Completing reading assessment questions (3-5 short, fixed choice questions per set) by 8:45 AM on the day of the class in which those readings are discussed;
- ◇ Two in-class independent tests, to evaluate your comprehension of themes and concepts emphasized in class meetings;
- ◇ Two group analysis and critical thinking quizzes to gain practice analyzing text and thinking critically about agricultural and food science & policy. Your notes on the assigned reading will be graded individually and you will earn complete a quiz with two to three classmates for a group quiz grade
- ◇ Collaborative interest group project, in which you will work with classmates simulating aspects of the policy-making process in response to a specific proposal;
- ◇ Final exam scheduled by the University, on the themes of the course.

¹ Components of critical thinking are drawn from <http://www.criticalthinking.org/aboutCT/definingCT.shtml> .

This syllabus is subject to change. Course materials and assignments will be posted on the University CANVAS course webpage: <http://canvas.psu.edu> , as will any changes. You can log into CANVAS using your Penn State e-mail account name (without “psu.edu”) and your access or e-mail password.

Grading Elements & Deadlines	Points	Date
Reading questions (indicated on the syllabus as RQ , answer at least 20 of 25 sets for full credit)	75	before each class
Attendance, fieldtrip participation, & in-class exercises	45	regularly
Independent Tests (2 for 40 points each)	80	Sept. 26, Nov. 9
Group Analysis & Critical Thinking Quizzes: (10 points for your preparation notes, 15- 20 points for group quiz)		
Lessons of the Dust Bowl	30	Oct. 19
Sustainable Agriculture Criteria	25	Dec. 5
Interest group project		
Group request to testify/position statement	5	Oct. 31
Oral testimony by interest group	20	Nov. 16
Written interest group profile & policy response	55	Nov. 16
Individual contribution assessment*	20	Nov. 16
Final Exam	<u>100</u>	University schedules
TOTAL	450	

(*Note that the interest group project includes both group and individual-based assessment. The request to testify, the oral presentation and the written paper are graded as a group (total 80 points. Another 20 points are individually allocated, based on the combined evaluations by other members of your group regarding your role in and contribution to the overall project.)

You can earn extra-credit for working 2 hours at the PSU Student Farm under direction of the farm manager and farm interns. See: <http://www.studentfarm.psu.edu>. You must sign up to volunteer when the farm crew are there and can record the time you volunteer: <http://www.studentfarm.psu.edu/get-involved/volunteer/>. You can drive, walk or travel there via bike, use this route: <http://www.studentfarm.psu.edu/find-the-farm/> Do NOT walk or ride a bike to the farm via Fox Hollow Rd which does not have a sidewalk.

You can also volunteer on the following dates when van transportation will be provided, leaving at 11am and returning at 1pm on: **Thursday Aug. 31, Monday Sept. 11, Thursday Oct. 5, and Monday Oct. 9**. The van will leave from the fieldtrip bus stop on Curtain Rd. next to the Ag. Admin Bldg. & ASI greenhouses.

Course Schedule

<i>Week/ Date</i>	<i>Topic, Assigned Readings and Activities</i>
Week 1 Course Introduction	
Aug. 22	<i>Introduction:</i> Welcome and overview of the course semester.
Aug. 24	<i>Overview of Issues and Challenges in Sustainable Agriculture</i> <u>Reading (RQ):</u> S. R. Gliessman. 2007. Need for Sustainable Food Production. <i>In Agroecology. The Ecology of Sustainable Food Systems.</i> Pg. 3-17. CRC Press. Boca Raton, FL.
Week 2 Agricultural Transitions, Farmers and the Food System	
Aug. 29	<u>Reading (RQ):</u> i. C. C. Sheaffer and K. M. Moncada. 2012. 2 nd Edition. Chpt.1, History of Agriculture. Pg. 22-32. <i>In Introduction to Agronomy: Food, Crops and Environment.</i> Cengage Learning.
Aug. 31	<i>Agricultural Transitions;</i> <u>Reading (RQ):</u> i. C. C. Sheaffer and K. M. Moncada. 2012. 2 nd Edition. Chpt.2, Agriculture Today. pg. 36-55. <i>In Introduction to Agronomy: Food, Crops and Environment.</i> Cengage Learning.
Week 3 Introduction to Crops and Soils	
Sept. 5	<i>Introduction to Crops</i> <u>Reading (RQ):</u> R. E. Mullen. 1996. Crop Plant Classification and Identification. Pg. 33-42. <i>In Crop Science: Principles and Practice.</i> Pearson Custom Publishing.
Sept. 7	<i>Introduction to Soils</i> <u>Reading (RQ):</u> S. R. Gliessman. 2007. Soil. In <i>Agroecology. Ecology of Sustainable Food Systems.</i> Pg. 99-114. CRC Press. Boca Raton, FL.
Week 4 Digging into Soil Science	
Sept. 12	<i>Soil Health</i> <u>Readings (RQ):</u> F. Magdoff and H. Van Es. 2009. Part One: Healthy Soils and Organic Matter: What it is and Why it's so important? Pg. 3-22. In <i>Building Soils for Better Crops.</i> Edition 3. Sustainable Agriculture Network, USDA. Beltsville, MD. See: http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version
Sept. 14	<u>Reading (RQ):</u> W. Dubbin. 2001. Soil fertility. In <i>Soils.</i> London: The Natural History Museum. Pg. 56-74.
Week 5 Soils and Cropping Systems	
Sept. 19	<u>Reading (RQ):</u> i. F. Magdoff and H. Van Es. 2009. Cover Crops, read pages 101-103, browse the rest of the Cover Crop Chapter. ii. F. Magdoff and H. Van Es. 2009. Crop Rotations pg. 99-108. In <i>Building Soils for Better Crops.</i> Edition 3. Sustainable Agriculture Network, USDA. Beltsville, MD. http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-

Sept. 21 **Fieldtrip to PSU Agronomy Research Farm, Rock Springs.**
Please dress to walk in farm fields and meet promptly at 9:05 am on Curtain Rd. behind the ASI Greenhouses and the Ag Administration Bldg parking lot to board the Blue bus.

Reading (RQ): For today, watch the following 3 short videos online about soil tillage and soil health and answer the reading questions on Angel:

1. The Science of Soil Health: What Happens When You Till?

<https://www.youtube.com/watch?v=Azb0So8M50Q>;

2. The Science of Soil Health: Nightcrawlers and Soil Water Flow

<https://www.youtube.com/watch?v=OcpXeSRGdXA>;

3. The Science of Soil Health: Compaction

https://www.youtube.com/watch?v=GTUVRieYoZ8&list=PL4J8PxoprGa3wFYX Fu-BW_mMatleIt0&index=9

Week 6 Integrated Pest Management & Student Farm Fieldtrip

Sept. 26 **Independent Test 1**

Reading (RQ): C.C. Sheaffer, and K. M. Moncada. 2009. Integrated Pest Management. *In Introduction to Agronomy: Food, Crops and Environment* Pg. 384-391. Delmar Cengage Learning. Clifton, NY. 12-21.

Sept. 28 **Fieldtrip to PSU Student Farm, Please dress to walk in farm fields and meet promptly at 9:05 am on Curtain Rd. behind the ASI greenhouses and the Ag Administration Bldg parking lot to board the Bus.**

Week 7 Genetically Engineered Crops for Pest Management and Introduction to Public Policy

Oct. 3 **Reading (RQ):** i. The Committee on the Impact of Biotechnology on Farm-Level Economics and Sustainability. National Academy of Sciences. 2010. The Impact of Genetically Engineered Crops on Farm Sustainability in the United States Report in Brief. ii. J. Carrico and K. Scott. 2016. Resistance and control top of mind concerns for soybean growers. *J. of High Plains/Midwest Ag.* Sept. 27, 2016.

Oct. 5 **Reading (RQ):** Charles L. Cochran and Eloise F. Malone. 1995. Basic Concepts in Public Policy. *Public Policy: Perspectives and Choices.* Ch. 1: 11-23.

Week 8 Introduction to the Policy Making Process and the Agricultural and Food Policy Arena

Oct. 10 **Reading (RQ):** C. E. Lindblom and E. J. Woodhouse. 1993. *The Policy-making Process* (3rd ed.). Upper Saddle River, NJ: Prentice Hall. Chpt.1, pp. 13-32.

Oct. 12 **Readings (RQ):** R.D. Knutson, J.B. Penn and B.L. Flinchbaugh. 1998. Food and agriculture policy interest groups. In *Agricultural and Food Policy* (4th ed.). Upper Saddle River, NJ: Prentice Hall. Pp. 79-112.

Select Interest Groups. This is an important class to select your interest group.

Week 9 US Agricultural Policy and the Dustbowl

Oct. 17 **Interest Groups Assigned and Interest Group Assignment introduced.**

Reading (RQ): i. R. D. Knutson, J. B. Penn B.L. Flinchbaugh, and J. L. Outlaw. 2007. US Farm Policies, Chpt. 7 pp. 86-112. In *Agricultural and Food Policy* (6th

ed.). Upper Saddle River, NJ: Prentice Hall. Pp. 79-112. Pearson, Prentice Hall. Upper Saddle River, NJ.

i Class time for group work to prepare your request to testify and paper. Attendance is critical.

i. Browse, with particular attention to Crop Commodity Programs and Conservation links: <http://www.ers.usda.gov/agricultural-act-of-2014-highlights-and-implications.aspx>

Oct. 19 **Group Quiz on the assigned reading:**

W. Lockeretz. 1978. *The Lessons of the Dust Bowl*. American Scientist 66: 560-569. Bring your notes to class for 10 points towards the 30 points group quiz grade.

Week 10 Conservation Policies and Critique of US Corn and Commodity Policies

Oct. 24 US Conservation Policy:

Reading (RQ): i. Z. Cain and S. Lovejoy. 2004. History and Outlook for Farm Bill Conservation Programs. *Choices*(4). <http://www.choicesmagazine.org/2004-4/policy/2004-4-09.htm>. ii. Additional summary of Farm Bill conservation programs: <http://nationalaglawcenter.org/research-by-topic/conservation-programs/>

Oct. 26 ***Class time for group work to prepare your request to testify and paper. Attendance is critical.***

Readings (RQ):

i. It's Time to Rethink America's Corn System. Jonathan Foley. March 5, 2013. <http://www.scientificamerican.com/article/time-to-rethink-corn/>

ii. Read the Summary and Infographics from the report: Water and Climate Risks Facing U.S. Corn Production CERES. B. Barton & S.E. Clark. June, 2014. Ceres Report. i. <http://www.ourenergypolicy.org/wp-content/uploads/2014/06/ceres-corn.pdf>

iii. Imhoff, Daniel. 2012. Public Health and Nutrition: Building 21st Century Food Systems, Fighting Chronic Disease. Chpt. 16. *In Food Fight: The Citizens Guide to the Next Food and Farm Bill*. 2nd Edition. Watershed Media, Headlsburg, CA. See also additional readings assigned for Nov. 8

Week 11 Farm Bill, Public Health, and Interest Groups in Class Work time

Oct. 31 ***Request to Testify Due***

Readings (RQ): Read one of the following two articles and browse the other: i. Food without Thought How U.S. Farm Policy Contributes to Obesity. H. Schoonover and M. Muller, IATP Environment and Agriculture Program. Published November 2006. Institute for Agriculture and Trade Policy <http://iatp.org/documents/food-without-thought-how-us-farm-policy-contributes-to-obesity> ii. Do Farm Subsidies Cause Obesity? Dispelling Common Myths about Public Health and the Farm Bill. White paper by Food and Water Watch and the Public Health Institute. <https://www.foodandwaterwatch.org/sites/default/files/Farm%20Subsidies%20Obesity%20Report%20Oct%202011.pdf>

Nov. 2 ***Your Interest Group Request to Testify Statement returned. Class time for groups to review requests to testify.***

Week 12 Water Quality Science & Policy

Nov. 7 *In class viewing of Video: "Troubled Waters: A Mississippi River Story"* Video. University of Minnesota's Bell Museum of Natural History

Nov. 9 **Test 2**
Readings (RQ): i. *Chesapeake Bay Monitoring "Monitoring for Management Actions"*2. Understanding the bay's problems. Maryland Department of Natural Resources.http://www.chesapeakebay.net/documents/Monitoring_for_Management_Actions_First_Biennial_Report.pdf
ii. Got to the Chesapeake Bay Program Website Bay 101 <http://www.chesapeakebay.net/discover/bay101>; Watch the following 5 short videos: Bay 101 Algal Blooms; ii. Bay 101 Fish Kills, iii. Bay 101 Sediment; iv. Dissolved Oxygen; v, Population Growth;

Week 13 Water Quality Science & Policy & Mock Congressional Testimony

Nov. 14 **Reading (RQ):** i. Chesapeake Bay TMDL Fact Sheet. EPA. See: <https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-fact-sheet>
ii. Browse the Chesapeake Bay Total Maximum Daily Load Website. Browse the Ensuring Results page and diagram read about number of Elements or scroll down the website and read about the WIPs and Milestones. See: <https://www.epa.gov/chesapeake-bay-tmdl>

Nov. 16 **Mock Congressional Hearing and Strategies for Sustainable Agriculture Oral Testimony of Interest Groups at Mock Congressional Hearing Interest Group Profile and Policy Response Paper Due. Attendance is mandatory.** We will devote the entire class period to oral presentations for the interest group project.

Nov. 20-24 **Enjoy the Thanksgiving Break!**
Strategies for Sustainable Agriculture

Nov. 28 **Reading (RQ):** i. Paul Kristiansen and Charles Merfield. 2006. Overview of organic agriculture. In *Organic Agriculture: A Global Perspective*. Cornell University Press. Ch. 1. Pg. 1 – 23.

Nov. 30 **Reading (RQ):** i. Read pages 1-15 of K. Painter. 2007. An Analysis of Food-Chain Demand for Differentiated Farm Commodities: Implications for the Farm Sector. *USDA Rural Business & Cooperative Programs. Research Report 215*

Week 15 Strategies for Sustainable Agriculture

Dec. 5 **Group Analysis and Quiz:** Criteria for assessing and promoting Sustainable Agriculture. i. Allen, D. Van Dusen, J. Lundy, & S. Gliessman. 1991. Integrating social, environmental, and economic issues in sustainable agriculture. *Am. J. of Alt. Ag.* 6(3): 34-39; ii. T. Crews, C. L. Mohler, & A.G. Power. 1991. Energetics and ecosystem integrity: The defining principles of sustainable agriculture. *Am. J. Alt Ag.* 6 (3): 146-149.

Dec. 7 **Reading (RQ):** Reganold, J. P., D. Jackson-Smith, S. S. Batie, R. R. Harwood, J. L. Kornegay, D. Bucks, C. B. Flora, J. C. Hanson, W. A. Jury, D. Meyer, A. Schumacher Jr., H. Sehmsdorf, C. Shennan, L. A. Thrupp, P. Willis. 2011. Transforming US Agriculture. *Science.* 332. 670-671.

Final Exam: University Schedules

Class policies

- Discussion of issues and concepts is *always* welcome. Feel free to ask questions, make comments (on the topic, please!) and raise points at any time.
- Class participation is necessary for this class to be successful. Failure to attend will negatively affect your grade.
- You are responsible for all information given out in class. Failure to obtain information or receive announcements in class is no excuse for missing assignments or for turning assignments in late.

Academic Integrity

Penn State and the College of Agricultural Sciences are very concerned about academic integrity. The reputation of the University depends on the good behavior of students and faculty. Alumni depend on you, the student, to uphold the reputation of their degree. You will depend on future students to uphold the reputation of your degree. In your immediate future, both during your years in college and after earning your degree, you will seek employment. How employers view you will depend on the reputation of the University, your major, and the employer's experience with past students. Academic integrity speaks to the quality of your education. It means that you and others have done the work for which you have received a grade.

What are some examples of violations of academic integrity?

- Allowing another person to look at or copy your exam, quiz or assignment.
- Submitting a lab report, project report, or paper with the name of a person that did not work on the report or paper.
- Passing answers via notes, electronic devices, or other methods.
- Discussing the answers to an exam or assignment prior to completing the exam or assignment.
- Submitting a lab report, project report, or paper without proper citations.

<http://agsci.psu.edu/students/resources/academic-integrity/college-guidelines-for-academic-integrity-pdf>

Disabilities

The Office of **Disability Services** provides services for disability related concerns of Penn State students at the University Park campus and acts in an advisory capacity to the Disability Contact Liaisons at other Penn State locations. See: <http://equity.psu.edu/ods/>.

If you anticipate needing any type of accommodation in this course or have questions about physical access, *please tell the instructor as soon as possible*. Reasonable accommodations will be made for all students with disabilities, but it is the student's responsibility to inform the instructor early in the term. Do not wait until just before an exam to decide you want to inform the instructor of a learning disability; any accommodations for disabilities.

Course Abbreviation and Number: AGECO 134, Sustainable Agriculture Science and Policy

Credits: 3 credits

Prerequisites/Co-requisites/Concurrent Requirements/Recommended Preparation: There are no prerequisites for this course

Attributes/Designations: General Inter-domain GN GS

General Education Learning Objectives:

General Education: i. Effective Communication, ii. Critical and Analytical Thinking, iii. Integrative Thinking

Course Description: This inter-domain (GN/GS) general education course addresses the science, socio-economics, and politics of managing food and fiber production systems; and the sustainability implications of current practices and future options. The course will teach students about the soil, plant, animal, and ecological sciences; technologies, socio-economic implications, and policies of our agroecosystems in an integrated manner. We will examine agricultural scientific, agricultural policy, and economic opportunities to enhance the sustainability of agriculture for food and fiber production. Students will have many opportunities to examine and critically analyze scientific knowledge and policies during discussions, writing exercises, and role playing to develop analytical and communication skills. There are no prerequisites for this course. This course can link with other courses that address how research and efforts in agricultural sciences, ecology, policy, economics, philosophy, education, and communication influence sustainable management of natural resources for the present and the future.

Course Learning Objectives:

By the end of this course, students will be able to:

- Identify key issues in debates about the sustainability of agriculture;
- Apply both agricultural science and social science principles and concepts in assessing historical and current problems of the food and agricultural system;
- Identify agriculture's diverse interest groups and explain their roles and concerns in the agricultural policymaking process;
- Evaluate the intended and unintended consequences of specific farm and agricultural policies;
- Employ integrative thinking to describe natural and social scientific knowledge and approaches to promote sustainable agriculture.
- Specify and justify their own definition of sustainable agriculture, and strategies to promote it.

Course Materials:

This is an interdisciplinary course with readings from multiple sources. Rather than suggest that you purchase multiple books, selected readings from diverse sources have been placed either on the library's Electronic Reserves under AGECO 134 (libraries.psu.edu), or are available on the internet and are indicated in the syllabus with Web URL's. Some of the issues and topics we will study are likely to generate news articles reporting the latest developments. Therefore, we will occasionally assign supplemental articles and editorials from the *New York Times* to link class content to "real world" outcomes and policy. You can get the *New York Times* from one of the newspaper boxes on campus using your student ID.

Course Expectations and Approach:

In considering the connections between science and policy and their combined effect on sustainable agriculture, this course emphasizes critical thinking. Critical thinking involves:

1. Raising vital questions and problems and formulating them clearly;
2. Gathering and assessing relevant information, using well-reasoned criteria and standards to evaluate such information;
3. Considering alternative systems of thought with an open mind, remaining attuned to their assumptions, implications and practical consequences; and
4. Communicating effectively with others to determine solutions to complex problems.¹

We will introduce you to various new concepts, which will be useful tools in thinking more critically about the subjects of this course. We recommend you keep a running list of course concepts and record your emerging thinking about them. We particularly encourage you to record your thoughts about that challenges and key elements of sustainable agriculture

¹ Components of critical thinking are drawn from <http://www.criticalthinking.org/aboutCT/definingCT.shtml> .

The class format will include instructor lectures, guest presentations, in-class activities, two field trips, videos, small-group activities and projects, and class discussion. In lectures, we will elaborate key issues, present background and related material, and pose questions to guide our in-class activities and discussions. Lectures cannot provide a substitute for you completing the assigned readings and you will need to keep up with the readings to participate actively in class and maximize your learning. To ensure that you do keep up, there are regular reading question exercises that you will complete on our CANVAS course site (go to <https://canvas.psu.edu>). These reading questions are a few short questions about class readings marked in the syllabus with "RQ." To get credit, reading questions must be completed on-line prior to the class they are listed on the syllabus, and those readings will be discussed in class. There are more than 75 points possible in the Reading Questions. So, if you select some incorrect answers or miss completing an online set of questions, you can still earn full credit by answering some other reading questions correctly. If you answer more than 75 points correctly, you will earn some extra credit.

You will be evaluated in this course in a variety of ways, drawing on both individual and collaborative work. These include:

- ◇ Completing reading assessment questions (3-5 short, fixed choice questions per set) by 8:45 AM on the day of the class in which those readings are discussed;
- ◇ Two in-class independent tests, to evaluate your comprehension of themes and concepts emphasized in class meetings;
- ◇ Two group analysis and critical thinking quizzes to gain practice analyzing text and thinking critically about agricultural and food science & policy. Your notes on the assigned reading will be graded individually and you will earn complete a quiz with two to three classmates for a group quiz grade
- ◇ Collaborative interest group project, in which you will work with classmates simulating aspects of the policy-making process in response to a specific proposal;
- ◇ Final exam scheduled by the University, on the themes of the course.

This syllabus is subject to change. Course materials and assignments will be posted on the University CANVAS course webpage: <http://canvas.psu.edu>, as will any changes. You can log into CANVAS using your Penn State e-mail account name (without "psu.edu") and your access or e-mail password.

<u>Grading Elements & Deadlines</u>	<u>Points</u>	<u>Date</u>
Reading questions (indicated on the syllabus as RQ, answer at least 20 of 25 sets for full credit)	75	before each class
Attendance, fieldtrip participation, & in-class exercises	45	regularly
Independent Tests (2 for 40 points each)	80	Sept. 25, Nov. 1
Group Analysis & Critical Thinking Quizzes: (10 points for your preparation notes, 15- 20 points for group quiz)		
Lessons of the Dust Bowl	30	Oct. 18
Sustainable Agriculture Criteria	25	Dec. 4
Interest group project		
Group request to testify/position statement	5	Oct. 30
Oral testimony by interest group	20	Nov. 15

Written interest group profile & policy response	55	Nov. 15
Individual contribution assessment*	20	Nov. 15
Final Exam	<u>100</u>	University schedules
TOTAL	450	

(*Note that the interest group project includes both group and individual-based assessment. The request to testify, the oral presentation and the written paper are graded as a group (total 80 points. Another 20 points are individually allocated, based on the combined evaluations by other members of your group regarding your role in and contribution to the overall project.)

Course Schedule

<i>Week/ Date</i>	<i>Topic, Assigned Readings and Activities</i>
<i>Week 1</i>	<i>Course Introduction</i>
Aug. 22	<i>Introduction: Welcome and overview of the course semester.</i>
Aug. 23	<i>Overview of Issues and Challenges in Sustainable Agriculture</i> <u>Reading (RQ):</u> S. R. Gliessman. 2007. Need for Sustainable Food Production. <i>In Agroecology. The Ecology of Sustainable Food Systems.</i> Pg. 3-17. CRC Press. Boca Raton, FL.
<i>Week 2</i>	<i>Agricultural Transitions, Farmers and the Food System</i>
Aug. 28	<u>Reading (RQ):</u> i. C. C. Sheaffer and K. M. Moncada. 2012. 2 nd Edition. Chpt.1, History of Agriculture. Pg. 22-32. <i>In Introduction to Agronomy: Food, Crops and Environment.</i> Cengage Learning.
Aug. 30	<i>Agricultural Transitions;</i> <u>Reading (RQ):</u> i. C. C. Sheaffer and K. M. Moncada. 2012. 2 nd Edition. Chpt.2, Agriculture Today. pg. 36-55. <i>In Introduction to Agronomy: Food, Crops and Environment.</i> Cengage Learning.
<i>Week 3</i>	<i>Introduction to Crops and Soils</i>
Sept. 4	<i>Introduction to Soils</i> <u>Reading (RQ):</u> S. R. Gliessman. 2007. Soil. <i>In Agroecology. Ecology of Sustainable Food Systems.</i> Pg. 99-114. CRC Press. Boca Raton, FL.
Sept. 6	<i>Fieldtrip to PSU Agronomy Research Farm, Rock Springs.</i> <i>Please dress to walk in farm fields and meet promptly at 9:05 am on Curtain Rd. behind the ASI Greenhouses and the Ag Administration Bldg parking lot to board the Blue bus.</i> <u>Reading questions (RQ):</u> For today, watch the following 3 short videos online about soil tillage and soil health and answer the reading questions on Angel: 1. The Science of Soil Health: What Happens When You Till? https://www.youtube.com/watch?v=Azb0So8M50Q; 2. The Science of Soil Health: Nightcrawlers and Soil Water Flow https://www.youtube.com/watch?v=OcpXeSRGdXA; 3. The Science of Soil Health: Compaction https://www.youtube.com/watch?v=GTUVRieYoZ8&list=PL4J8PxoprGa3wFYSXFu-BW_mMatlelt0&index=9
<i>Week 4</i>	<i>Digging into Soil Science</i>
Sept. 11	<i>Soil Health</i> <u>Readings (RQ):</u> F. Magdoff and H. Van Es. 2009. Part One: Healthy Soils and Organic Matter: What it is and Why it's so important? Pg, 3-22. <i>In Building Soils for Better Crops.</i> Edition 3. Sustainable Agriculture Network, USDA. Beltsville, MD. See: http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version

Sept. 13	<i>Introduction to Crops</i> Reading (RQ): R. E. Mullen. 1996. Crop Plant Classification and Identification. Pg. 33-42. In <i>Crop Science: Principles and Practice</i> . Pearson Custom Publishing.
Week 5	<i>Soils and Cropping Systems</i>
Sept. 18	Reading (RQ): i. F. Magdoff and H. Van Es. 2009. Cover Crops, read pages 101-103, browse the rest of the Cover Crop Chapter. ii. F. Magdoff and H. Van Es. 2009. Crop Rotations pg. 99-108. In <i>Building Soils for Better Crops</i> . Edition 3. Sustainable Agriculture Network, USDA. Beltsville, MD. http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version
Sept. 20	Reading (RQ): W. Dubbin. 2001. Soil fertility. In <i>Soils</i> . London: The Natural History Museum. Pg. 56-74.
Week 6	<i>Integrated Pest Management</i>
Sept. 25	Independent Test 1 Reading (RQ): C.C. Sheaffer, and K. M. Moncada. 2009. Integrated Pest Management. In <i>Introduction to Agronomy: Food, Crops and Environment</i> Pg. 384-391. Delmar Cengage Learning. Clifton, NY. 12-21.
Sept. 27	Reading (RQ): i. The Committee on the Impact of Biotechnology on Farm-Level Economics and Sustainability. National Academy of Sciences. 2010. The Impact of Genetically Engineered Crops on Farm Sustainability in the United States Report in Brief. ii. J. Carrico and K. Scott. 2016. Resistance and control top of mind concerns for soybean growers. J. of High Plains/Midwest Ag. Sept. 27, 2016.
Week 7	<i>Student Farm Fieldtrip and Introduction to Public Policy</i>
Oct. 2	<i>Fieldtrip to PSU Student Farm, Please dress to walk in farm fields and meet promptly at 9:05 am on Curtain Rd. behind the ASI greenhouses and the Ag Administration Bldg parking lot to board the Bus.</i>
Oct. 4	Reading (RQ): Charles L. Cochran and Eloise F. Malone. 1995. Basic Concepts in Public Policy. <i>Public Policy: Perspectives and Choices</i> . Ch. 1: 11-23.
Week 8	<i>Introduction to the Policy Making Process and the Agricultural and Food Policy Arena</i>
Oct. 9	Reading (RQ): C. E. Lindblom and E. J. Woodhouse. 1993. <i>The Policy-making Process</i> (3 rd ed.). Upper Saddle River, NJ: Prentice Hall. Chpt.1, pp. 13-32.
Oct. 11	Readings (RQ): R.D. Knutson, J.B. Penn and B.L. Flinchbaugh. 1998. Food and agriculture policy interest groups. In <i>Agricultural and Food Policy</i> (4 th ed.). Upper Saddle River, NJ: Prentice Hall. Pp. 79-112. <i>Select Interest Groups. This is an important class to select your interest group.</i>
Week 9	<i>US Agricultural Policy and the Dustbowl</i>
Oct. 16	<i>Interest Groups Assigned and Interest Group Assignment introduced</i> Reading (RQ): i. R. D. Knutson, J. B. Penn B.L. Flinchbaugh, and J. L. Outlaw. 2007. US Farm Policies, Chpt. 7 pp. 86-112. In <i>Agricultural and Food Policy</i> (6 th ed.). Upper Saddle River, NJ: Prentice Hall. Pp. 79-112. Pearson, Prentice Hall. Upper Saddle River, NJ.

	<p>i. Browse, with particular attention to Crop Commodity Programs and Conservation links: http://www.ers.usda.gov/agricultural-act-of-2014-highlights-and-implications.aspx</p>
Oct. 18	<p>Group Quiz on the assigned reading: W. Lockeretz. 1978. <i>The Lessons of the Dust Bowl</i>. <i>American Scientist</i> 66: 560-569. Bring your notes to class for 10 points towards the 30 points group quiz grade.</p>
Week 10	<p><i>Conservation Policies and Critique of US Corn and Commodity Policies</i></p>
Oct. 23	<p>US Conservation Policy: Reading (RQ): i. Z. Cain and S. Lovejoy. 2004. History and Outlook for Farm Bill Conservation Programs. <i>Choices</i>(4). http://www.choicesmagazine.org/2004-4/policy/2004-4-09.htm. ii. Additional summary of Farm Bill conservation programs: http://nationalaglawcenter.org/research-by-topic/conservation-programs/</p>
Oct. 25	<p><i>Class time for group work to prepare your request to testify and paper. Attendance is critical.</i> Readings (RQ): i. It's Time to Rethink America's Corn System. Jonathan Foley. March 5. 2013. http://www.scientificamerican.com/article/time-to-rethink-corn/ ii. Read the Summary and Infographics from the report: Water and Climate Risks Facing U.S. Corn Production CERES. B. Barton & S.E. Clark. June, 2014. Ceres Report. i. http://www.ourenergypolicy.org/wp-content/uploads/2014/06/ceres-corn.pdf iii. Imhoff, Daniel. 2012. Public Health and Nutrition: Building 21st Century Food Systems, Fighting Chronic Disease. Chpt. 16. <i>In Food Fight: The Citizens Guide to the Next Food and Farm Bill</i>. 2nd Edition. Watershed Media, Headlsburg, CA. See also additional readings assigned for Nov. 8</p>
Week 11	<p><i>Farm Bill, Public Health, and Interest Groups in Class Work time</i></p>
Oct. 30	<p><i>Request to Testify Due</i> Readings (RQ): Read one of the following two articles and browse the other: i. <u>Food without Thought</u> How U.S. Farm Policy Contributes to Obesity. H. Schoonover and M. Muller, IATP Environment and Agriculture Program. Published November 2006. Institute for Agriculture and Trade Policy http://iatp.org/documents/food-without-thought-how-us-farm-policy-contributes-to-obesity ii. Do Farm Subsidies Cause Obesity? Dispelling Common Myths about Public Health and the Farm Bill. White paper by Food and Water Watch and the Public Health Institute. https://www.foodandwaterwatch.org/sites/default/files/Farm%20Subsidies%20Obesity%20Report%20Oct%202011.pdf</p>
Nov. 1	<p><i>Test 2</i> Your Interest Group Request to Testify Statement returned. Class time for groups to review requests to testify.</p>

Week 12	<i>Water Quality Science & Policy</i>
Nov. 6	<i>In class viewing of Video: "Troubled Waters: A Mississippi River Story" Video.</i> University of Minnesota's Bell Museum of Natural History
Nov. 8	Readings (RQ): i. <i>Chesapeake Bay Monitoring "Monitoring for Management Actions" 2. Understanding the bay's problems.</i> Maryland Department of Natural Resources. http://www.chesapeakebay.net/documents/Monitoring_for_Management_Actions_First_Biennial_Report.pdf ii. Got to the Chesapeake Bay Program Website Bay 101 http://www.chesapeakebay.net/discover/bay101 ; Watch the following 5 short videos: Bay 101 Algal Blooms; ii. Bay 101 Fish Kills, iii. Bay 101 Sediment; iv. Dissolved Oxygen; v, Population Growth;
Week 13	<i>Water Quality Science & Policy & Mock Congressional Testimony</i>
Nov. 13	Reading (RQ): i. Chesapeake Bay TMDL Fact Sheet. EPA. See: https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-fact-sheet ii. Browse the Chesapeake Bay Total Maximum Daily Load Website. Browse the Ensuring Results page and diagram read about number of Elements or scroll down the website and read about the WIPs and Milestones. See: https://www.epa.gov/chesapeake-bay-tmdl
Nov. 15	<i>Mock Congressional Hearing and Strategies for Sustainable Agriculture Oral Testimony of Interest Groups at Mock Congressional Hearing</i> Interest Group Profile and Policy Response Paper Due. Attendance is mandatory. We will devote the entire class period to oral presentations for the interest group project
Nov. 19-23	Enjoy the Thanksgiving Break!
Week 14	<i>Strategies for Sustainable Agriculture</i>
Nov. 27	Reading (RQ):. i. Paul Kristiansen and Charles Mertfield. 2006. Overview of organic agriculture. In <i>Organic Agriculture: A Global Perspective</i> . Cornell University Press. Ch. 1. Pg. 1 – 23.
Nov. 29	Reading (RQ): i. Read pages 1-15 of K. Painter. 2007. An Analysis of Food-Chain Demand for Differentiated Farm Commodities: Implications for the Farm Sector. <i>USDA Rural Business & Cooperative Programs. Research Report 215</i>
Week 15	<i>Strategies for Sustainable Agriculture</i>
Dec. 4	<i>Group Analysis and Quiz: Criteria for assessing and promoting Sustainable Agriculture.</i> i. Allen, D. Van Dusen, J. Lundy, & S. Gliessman. 1991. Integrating social, environmental, and economic issues in sustainable agriculture. <i>Am. J of Alt. Ag.</i> 6(3): 34-39; ii. T. Crews, C. L. Mohler, & A.G. Power. 1991. Energetics and ecosystem integrity: The defining principles of sustainable agriculture. <i>Am. J. Alt Ag.</i> 6 (3): 146-149.
Dec. 6	Reading (RQ): Reganold, J. P., D. Jackson-Smith, S. S. Batie, R. R. Harwood, J. L. Kornegay, D. Bucks, C. B. Flora, J. C. Hanson, W. A. Jury, D. Meyer, A. Schumacher Jr., H. Sehmsdorf, C. Shennan, L. A. Thrupp, P. Willis. 2011. Transforming US Agriculture. <i>Science.</i> 332. 670-671.

Class policies

- Discussion of issues and concepts is *always* welcome. Feel free to ask questions, make comments (on the topic, please!) and raise points at any time.
- Class participation is necessary for this class to be successful. Failure to attend will negatively affect your grade.
- You are responsible for all information given out in class. Failure to obtain information or receive announcements in class is no excuse for missing assignments or for turning assignments in late.

Academic Integrity

Penn State and the College of Agricultural Sciences are very concerned about academic integrity. The reputation of the University depends on the good behavior of students and faculty. Alumni depend on you, the student, to uphold the reputation of their degree. You will depend on future students to uphold the reputation of your degree. In your immediate future, both during your years in college and after earning your degree, you will seek employment. How employers view you will depend on the reputation of the University, your major, and the employer's experience with past students. Academic integrity speaks to the quality of your education. It means that you and others have done the work for which you have received a grade.

What are some examples of violations of academic integrity?

- Allowing another person to look at or copy your exam, quiz or assignment.
- Submitting a lab report, project report, or paper with the name of a person that did not work on the report or paper.
- Passing answers via notes, electronic devices, or other methods.
- Discussing the answers to an exam or assignment prior to completing the exam or assignment.
- Submitting a lab report, project report, or paper without proper citations.

<http://agsci.psu.edu/students/resources/academic-integrity/college-guidelines-for-academic-integrity-pdf>

Disabilities

The Office of Disability Services provides services for disability related concerns of Penn State students at the University Park campus and acts in an advisory capacity to the Disability Contact Liaisons at other Penn State locations. See: <http://equity.psu.edu/ods/>.

If you anticipate needing any type of accommodation in this course or have questions about physical access, *please tell the instructor as soon as possible*. Reasonable accommodations will be made for all students with disabilities, but it is the student's responsibility to inform the instructor early in the term. Do not wait until just before an exam to decide you want to inform the instructor of a learning disability; any accommodations for disabilities.