

ENTO 489, AGRICULTURE, SOCIETY, AND THE ENVIRONMENT

Class meeting schedule: T, R 12:45 - 2:00 p.m

EDCT 616

Spring 2014

I Course description

Agriculture, society, and the environment (ENTO 489) surveys the origins and evolution of agriculture as context for a critical review of contemporary agriculture, including environmental and human health issues surrounding agriculture in developing countries, and relying on case studies from Latin America and the fields of agriculture, agricultural development, and pest management. The course consists of biweekly lectures complemented with independent reading and discussion of textbooks.

The first portion of the course—which sets the stage for the course’s second portion—is a chronological survey of the origin and evolution of agriculture beginning in the Neolithic and the agricultural societies of the ancient worlds, through agriculture in the age of discovery, empires, and colonies, and to contemporary, energy-intensive and traditional agricultures, including current and likely future trends driven by agricultural biotechnology.

The second portion of the course focuses on traditional and export-oriented agriculture in Latin America, their present place and relevance in the region, and on some of the human health and environmental implications of adopting agricultural technologies designed for developed countries.

Students enrolled in the course will gain a basic understanding of (i) the origins and evolution of agriculture, (ii) the place and value of traditional agriculture and farmers in contemporary, developing countries, and (iii) some of the environmental and human health implications of careless pest management and use of imported agricultural technologies in developing countries. Ideally, after successfully completing this course students will think and act in ways that consider the dynamic nature of relationships between humans and crops, agriculture and environment, and human health and environmental impacts of mass demand and consumption of agricultural products.

The intended audience is students who are interested in pursuing careers or graduate study involving international policy, development, and agricultural and environmental research, living or traveling in developing countries, and becoming better-informed world citizens.

II Prerequisites

No prerequisite coursework is necessary.

III Course goals, objectives, and learning outcomes

The **goal** of the course is to survey the origins and evolution of agriculture, and examine some contemporary agricultural systems and their impacts on the environment and human health. The course’s emphases are on environmental issues surrounding agriculture. The intention is to provide students with elements that will allow them to understand the genesis of agriculture to its present



Central American children bathing in a 55-gal drum originally holding the insecticide Methyl Parathion (from Murray 1994)

condition in developed and developing countries as a basis for critical analyses of agriculture's human and environmental health implications.

The course has the following **objectives**:

- Review the origins of agriculture.
- Review important centers of early agriculture and crop domestication.
- Examine the historical importance of energy, water, chemistry, and genetics in agriculture, including in contemporary developed and developing countries.
- Examine the contexts in which traditional agricultural systems persist in developing countries.
- Examine human health and environmental implications of transferring developed-country agricultural technologies and goals to developing countries.
- Critically read and discuss course-relevant literature.
- Critically examine some of the human and environmental health consequences of agriculture and development through a book report.

The course pursues several **learning outcomes**.

- Firstly, students will be able to identify and describe some of the hidden costs of food and fiber production in developed and developing countries;
- Additionally, students will be able to contrast the value and costs of agricultural development strategies in developing countries that are based on direct transfer of goals and agricultural technologies from developed countries.
- Because of the course's use of case studies of environmental issues surrounding agriculture and Latin America, students will be able to describe the human health and environmental implications of export-oriented agriculture, and critically examine agricultural production systems and development strategies targeting that region.

IV Instructor and contact information

Instructor: Julio Bernal

-Biological Control Facility, rm. 116 (West campus, University Ave. @ Agronomy Rd.)

-Office hours: M, W, F 11 AM to 1 PM, and upon request

-Phone: (979) 862-8378, 845-2893

-e-mail: juliobernal@tamu.edu

TA: None currently assigned

-Office: NA

-Office hours: NA

-Phone: NA

-e-mail: NA

IV Textbooks and other materials

Two textbooks are required for course. These textbooks will be read during the semester (see *Lecture outline and assigned readings*), and comprehension of their content will be evaluated through a series of *Quizzes* and written *Reading reports* (see below).

Douglas L. Murray (1994). Cultivating crisis: The human cost of pesticides in Latin America. University of Texas Press, 3rd edition, 191 pp.

Angus Wright (2005). *The Death of Ramón González: The Modern Agricultural Dilemma.* University of Texas Press, revised edition, 422 pp.

Both texts are available at the TAMU Bookstore and from online vendors. Their combined cost is under \$50 (as of September 2011).

Any additional material associated with the course will be handed out and/or posted on-line (<http://ecampus.tamu.edu>) for students to download.

V Grading

The final score will be the sum of 5 *Quiz* scores (250 points), 1 *Final paper* (210 points), and 12 *Reading reports* (240 points), plus up to 70 bonus points for oral participation in class and discussions, and up to 35 points for lecture attendance (see below). Each *Quiz*, including the fifth (final) *Quiz*, will cover a set of lectures corresponding to one *Part* of the lecture series and corresponding assigned readings: The final *Quiz* is not comprehensive.

5 <i>Quizzes</i> (@ ~50 points each):	250 points (36%)
12 <i>Reading reports</i> (@ 20 points each):	240 points (34%)
<u>1 <i>Final paper</i> (@ 210 points):</u>	<u>210 points (30%)</u>
Total points:	700 points (100%)

Bonus points, oral participation:	70 points (10%)
Bonus points, attendance:	35 points (5%)

Maximum total points (incl. bonus points): 700 points

Final grades will be assigned as follows: ≥630 points (≥ 90%) = A; 560-629 points (80-89%) = B; 490-559 points (70-79%) = C; 420-489 points (60-69%) = D; <420 points (<60%) = F.

VI Lecture outline and assigned readings

The lectures and dates outlined below are tentative. While the instructor will strive to present all lectures according to the listed dates, uncontrollable circumstances may cause departures from the schedule. In particular, the pace of schedule coverage will wax or wane with student needs.

WEEK	LECTURE	LECTURE/ASSIGNED READING-READING REPORT
		Part I: Origins of agriculture and early agriculturalists
1/13	1	Agriculture—one word, many meanings, and obscure origins
	2	The birth of civilizations: A Neolithic revolution?
	—	No reading report due
1/20	3	Earliest agriculturalists I: Crop domestication in the Near East
	4	Earliest agriculturalists II: Crop domestication in the Far East
	—	Reading report: <i>Wright (2005). The death of Ramón González ...ch. 1, 2</i>
1/27	5	Earliest agriculturalists III: Crop domestication in Africa
	6	Earliest agriculturalists IV: Crop domestication in the Americas

	—	Reading report: Wright (2005). The death of Ramón González ...ch. 3
2/3	—	Quiz 1: lectures 1-6; Wright 2005, chapters 1-3
		PART II—From the Neolithic through the age of discovery, empires, and colonies
	7	Harnessing the Sun: Solar energy-driven farming
	—	Reading report: Wright (2005). The death of Ramón González ...ch. 4, 5
2/10	8	Water permeates life: Irrigation-driven farming
	9	New World agriculture I: The Andes
	—	Reading report: Wright (2005). The death of Ramón González ...ch. 6
	—	Final paper title due
2/17	10	New World agriculture II: Mesoamerica
	—	Reading report: Wright (2005). The death of Ramón González...ch. 7
	—	Quiz 2: lectures 7-10; Wright 2005, chapters 4-7
		PART III—Agriculture from the XIX century to the present
2/24	11	Birth of energy-intensive agriculture: Penguins, empires, and fertilizers
	12	Scientific agriculture: The Land Grant Colleges and Experiment Stations
	—	Reading report: Wright (2005). The death of Ramón González...ch. 8
3/3	13	The Neocaloric: Energy-intensive agriculture for the XX Century
	14	The Green Revolution: Energy-intensive agriculture for the periphery
	—	Reading report: Wright (2005). The death of Ramón González...ch. 9
3/10		S P R I N G B R E A K
3/17	15	Pest management in agriculture: Aseptic fields through chemistry
	16	The Gene Revolution that would be a Doubly Green Revolution
	—	Reading report: Wright (2005). The death of Ramón González...ch. 10
3/24	—	Quiz 3: lectures 11-16; Wright 2005, chapters 8-10
		PART IV—Primitive farmers? Traditional farming in Latin America
	17	Keepers of the seed: Germplasm and traditional farmers in Latin America
	—	Reading report: Wright (2005). The death of Ramón González ...ch. 11
3/31	18	The ancient as contemporary I: Subsistence farming in Mexico
	19	The ancient as contemporary II Subsistence farming in Peru
	—	Reading report: Murray (1994). Cultivating crisis: The human cost ...ch. 1-3
	—	Final paper preview due
4/7	—	Quiz 4: lectures 17-19; Wright 2005, chapter 11; Murray 1994, chapters 1-3

		PART V—Hidden costs of agricultural development and imports from developing countries
	20	Post-modern traditional farmers I: Traditional export crops
	—	Reading report: Murray (1994). <i>Cultivating crisis: The human cost ...ch. 4, 5</i>
4/14	21	Post-modern traditional farmers II: Central American cotton boom
	22	Post-modern traditional farmers III: Non-traditional export crops
	—	Reading report: Murray (1994). <i>Cultivating crisis: The human cost ...ch. 6-8</i>
4/21	23	Mexican fruits and vegetables: Real costs of year-round, cheap produce
	24	Coming to a crop diversity center near you: Transgenic maize in Mexico
	—	Final paper due
Final's week	—	Quiz 5: lectures 20-24; Murray 1994, chapters 4-8

VII Attendance

There is no minimal attendance requirement, though attendance to lectures is essential for students to do well in the course (see below). However, attendance will be monitored during the semester, and proper attendance will be rewarded: The student(s) with the highest attendance rate will receive 35 bonus points, and the remaining students a prorated amount according to their attendance rate. In addition, attendance to lectures is important because assigned readings are discussed—so corresponding points assigned—at the beginning of each lecture (see below).

Attendance will be monitored through student submission of written answers to questions posted during lecture sessions. The answers will be prepared on 3x5-inch index cards and submitted at the end of each lecture. The goal of these question-answer exercises is for students to discuss and synthesize the main points of each lecture immediately after lecture material is presented. To this end, 5 to 10-minute discussion periods will be allowed at a lecture's mid-point and conclusion so that students can turn to their neighbor to discuss lecture material, and prepare and submit the corresponding answers. All index cards will be returned to students prior to each quiz so that they can be used as study aides.

VIII Quizzes

The first four *Quizzes* will be held during regularly scheduled class times, and the fifth (final) *Quiz* will be held according to the University-wide final exam schedule (typically at the Registrar's web site, http://registrar.tamu.edu/General/FinalSchedule.aspx#_Spring_2014, as of October 2013).

Each *Quiz* will consist of a set of multiple-choice questions. Approximately half of the questions will come from material covered in lectures, and the balance from *Assigned readings*: Thus, to do well in the *Quizzes* portion of the course it is essential that students attend lectures and study *Assigned readings*.

Missed Quizzes. Students unable to take a *Quiz* on a scheduled date should contact the instructor immediately (before or after the scheduled date) so that they are given an opportunity to take the missed *Quiz* as soon as possible. Moreover, in order for students to be given the opportunity to take a missed *Quiz* it is essential that they (i) have a legitimate University-approved excuse, and (ii) provide adequate documentation substantiating the excuse (regulations at <http://student-rules.tamu.edu/>, as of

August 2011). Students that miss a *Quiz* and lack a legitimate excuse and adequate documentation will be assigned a score of zero points (0 points) on the corresponding *Quiz*.

IX Reading reports

Students are expected to carefully study all *Assigned readings*, and their comprehension of reading assignment content will be evaluated through written *Reading reports*, and through questions in each of the *Quizzes*. Additionally, students may gain bonus points through participation in discussion sessions concerning the *Assigned readings* prior to each lecture.

Students are required to submit (in hard-copy) a *Reading report* (including two questions) for each *Assigned reading* on a single sheet of paper at the beginning of each week's first lecture (Tuesday). These *Reading reports* will be used to assign points (see above) and guide the oral discussion. (Separately, the instructor will provide examples of *Reading reports* as guidance for students.)

Students are expected to demonstrate **critical thinking** in their *Reading reports*. So, students should avoid merely summarizing the information presented in the *Assigned readings*. Rather, they may summarize only to provide context (1 or 2 sentences), then critically discuss and offer fact-based perspectives and conclusions on the content of *Assigned readings*. Similarly, the questions posed by students within each *Reading report* should show that *Assigned readings* were read carefully, and also demonstrate **critical thinking**. For example, questions could be critical of (i.e. question) the *Assigned reading's* content, e.g., in the forms: "If X, then why Z?" or "Given that X, shouldn't Z follow?" (e.g., "If agriculture originated independently in several places and at several times, then why does it look so similar in all early civilizations?") The questions will be used by the instructor to facilitate discussion of *Assigned readings* by reading them aloud and soliciting answers from volunteering students. Student participation in this form will be basis of bonus oral participation points (see above).

Students responding orally to questions during the discussion sessions or participating during lecture (with questions or comments) will receive bonus participation points according to their total number of participations: The student with most oral participations will receive 70 bonus points, and the remaining students will receive points prorated according to their level of participation.

Missed Reading reports. Students unable to submit a *Reading report* due to a lecture absence should contact the instructor immediately (before or after the class date) so that they are given an opportunity to submit the *Reading report* as soon as possible. As in the case of *Quizzes*, it is essential that students (i) have a legitimate University-approved excuse, and (ii) provide adequate documentation substantiating the excuse (regulations at <http://student-rules.tamu.edu/>, as of August 2011). In the absence of a legitimate excuse and adequate documentation, students will be assigned a score of zero points (0 points) on the corresponding *Reading report*.

X Other information

Students are strongly encouraged to communicate to the instructor, or to the Teaching Assistant, any problems or difficulties that they encounter as early as possible during the semester. Contact information for both is noted above. The instructor and TA are able to help only those students that communicate with them, and they will be better able to help if contact is made as soon as students feel the need to do so.

Though attendance to lectures is not mandatory, it is important that students attend lectures for *Reading reports* credit (see above) and so that they do well in *Quizzes*. Only a small proportion of

students are capable of doing fairly well in *Quizzes* without attending lectures, and a few others may do well due to their good fortune: Unless a student knows for a fact that he/she belongs in any of these two categories, it is unlikely that he/she will do well in *Quizzes* without attending lectures.

XI ADA and academic integrity statements

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

Cheating of all types, including during exams and plagiarism in general, will not be tolerated. Rules and regulations concerning scholastic dishonesty, including cheating in exams or other assignments are available at the Honor System Office website (www.tamu.edu/aggiehonor, as of August 2011). As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., of others. In accordance with this definition, THE STUDENT IS COMMITTING PLAGIARISM IF HE OR SHE COPIES THE WORK OF ANOTHER PERSON AND TURNS IT IN AS HIS OR HER OWN, EVEN IF THE STUDENT RECEIVES PERMISSION TO DO SO FROM THAT PERSON.

Revised 11/27/13