WORLD AGRICULTURE, FOOD AND POPULATION
Environmental Studies 149, Anthropology 149, Geography 161
University of California, Santa Barbara

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2012 Fall

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1. INTRODUCTION

This class is about how to think about world agriculture, food and population. This means learning how to ask good questions, questions that lead to answers that increase our understanding as well as our ability to take action to reach our goals. The class focuses on concepts for thinking about the issues—it is not a survey course, though we will discuss specific case studies from around the world, including Santa Barbara County.

The world food crisis (WFC) is again our theme for this year’s class. Dramatically rising food prices, speculation by investors, the power of multinational agriculture and food corporations, the relationship between food production and climate change, lost harvests due to floods and droughts, controversy over the use of food for biofuels, riots by hungry people in the Third World, talk of new “green revolutions”, and diet changes by people in the industrial world have been more and more prominent in the news over the past years. How can we understand the current WFC? What are its historic roots? How can we solve it?

There are radically different solutions being proposed, and which one(s) of these is chosen will determine the world we will live in 10 years from now, 50 years from now. What kind of food will we be eating? How many people will be overweight? How many people will be hungry? Who will grow our food, and where? Will most of our crops be genetically engineered? Organically grown? Who will have the opportunity, the right, to eat healthy food? Will a growing population and inefficient agricultural production lead to fields displacing our remaining wilderness, to increasing conflict over irrigation water and other production resources, and increasing inequality of food distribution? Or will population size stabilize and even grow smaller, per capita consumption become less and more equal, and agriculture more environmentally and socially friendly and biologically diverse? There are many more alternatives—what kind of world would you like to live in? How can you help to make your vision for the future come true?

There are no objectively correct answers to the question “How should world agriculture, food and population change to solve the WFC?”—because the question is about goals, all answers are based in large part on subjective values, as well as on facts about the biophysical world and human society. The goal of World Agriculture is to empower you to find your own answers by analyzing theories, data, and values from different perspectives, looking at the historical development of the relationship between agriculture, food, and population, the current situation, and alternative futures. Quantitative and qualitative information is presented graphically, numerically, and narratively.

The challenge of finding a balance between the demand for food exerted by a growing population, and the economic, social and environmental costs of producing it has never been greater than it is at the beginning of the 21st century. World food production over the long term has been able to keep up with the demand for food, fiber and energy, as farming spread from its centers of origin thousands of years ago, and as farmers developed new crop varieties, technologies and social organizations. Modern industrial agriculture and the Green Revolution have greatly increased yields, and the new genetically engineered crop varieties promise even more. However, the negative impact of agricultural production on the Earth’s natural resource base is increasing, the social and economic structure of agriculture is changing dramatically, and many millions of people continue to go hungry while many more are malnourished. Meanwhile, the global human population of more than 7.0 billion in 2012 continues to grow, with a projected size of almost 10 billion by 2050.

Successfully meeting the challenge of balancing food production and the demand for food by a growing population with the need to conserve the natural resources on which future production depends, and to ensure that food is equitably distributed to eliminate hunger and malnutrition, requires a deep understanding of the relationships between agriculture, population, the environment, human society, and culture. Much discussion of this topic among scientists, policy makers and the public, centers on the concept of “sustainability”, and many agricultural development projects have the goal of making food production more sustainable. Yet there are many different definitions of sustainable agriculture, and many different ideas of how to achieve it.

This course will help you to gain an understanding of agricultural-food-population-environment problems and alternative solutions to them, so that you can constructively participate in the important decisions that people are making now and will have to make in the near future. These decisions are often based on misunderstanding and narrow partisan interests. One assumption of this course is that these decisions will be better if they are based on honest attempts to understand the issues in terms of scientific theory, empirical data, and values, and from a global perspective that respects local differences.
Another assumption is that the “evolution” of agriculture and human society is not unilineal in time or space, that human population growth and social and environmental change have dramatically changed decision contexts not only for small-scale traditionally-based agriculture, but for modern agriculture as well. Therefore, to obtain a balance between agriculture, food, population, and the environment, we need to search for basic principles that underlie both modern and traditional human societies, including agriculture, demography, values and social organizations. This is not a quick fix, but it may be the only way to solve the present WFC, and to avoid future ones.

2. REQUIREMENTS

This section provides details on requirements for the course, and may be modified or supplemented later.

2.1. LECTURES, READINGS AND STUDY QUESTIONS

Lectures are Tuesdays and Thursdays (9:30-10:45 a.m.) in TD 1701. Lecture/discussions will be based on the assumption that you have done the required reading by the date listed on the syllabus. All readings will be available via the class website in electronic form. **If you have not done the readings, it will be difficult for you to understand the lectures.**

Weekly study questions will guide you to the parts of readings that require the most attention and thought. You should read and understand the study questions before doing the reading, skim quickly through the reading to get the main points, then read it again more carefully and write out answers to the study questions. You will need a calculator to work through some of the study questions. **Attendance in lectures is required** but attendance is not recorded. What does this mean? It means that you are responsible for all material presented in lectures even when you cannot attend. Lecture notes will be posted on the course website after each lecture; **not all material presented in class will be included in the posted lectures.**

Please participate in the lectures by asking questions and contributing your knowledge to the discussion. In order not to disturb other students, arrive on time for the lecture and **do not pack up until the lecture is over. Turn off all cell phones, iPods, MP3 players etc. during lecture. Laptop computers are permitted in the lectures for taking notes, laptops are not permitted for other uses, as this disrupts the class for other students. This is your class too, so let’s work together to make it a great learning experience—please do not hesitate to ask students who are disruptive, including using laptops for non-class related purposes, to be considerate of the rest of the class and stop.**

2.2. WRITTEN WORK

All written work including the introductory essay and homework assignments for your sections must follow the format described here. It must be machine printed on 8.5 x 11 inch paper, single-spaced, with one inch margins on all four sides, staple in the upper left hand corner, use 12 point font such as Times New Roman, Arial or other standard font. Put your name, course number, and date in the upper right hand corner of the first page, and your last name and page number in the upper right hand corner of each subsequent page. Papers that are difficult to read because of poor printer quality will not be accepted. To conserve paper, you can print on both sides of the paper, or reuse paper that has one side previously used, as long as your assignment is clearly legible.

2.3. MODULES

You will have the opportunity to complete exercise modules for each week of the quarter. They are an integral part of the class—they help you understand concepts from lecture by applying them to specific cases, e.g. calculating the human carrying capacity of the world. You will be assigned to submit your written answers to some module questions (MQs) on Gauchospace as section assignments, and to take quizzes on some modules on Gauchospace. All modules will be posted on Gauchospace by 4 p.m. Sunday for the week beginning the following day (Monday). Instructions for completing modules will be sent to you by your TA. MQs, like SQs, will be the basis for some of the questions on the quizzes and final exam. Keys to the module questions will be posted after the discussion section meetings each week.

**This year you will be participating in evaluating and improving the modules.** All students will be assigned to one of two groups, and each group will receive a version of the module with different ways of presenting the information. **Therefore, it is important that you use only the version assigned to your group.** At the end of the quarter we will discuss the results in class.
2.4. DISCUSSION SECTIONS
Discussion sections will be integrated with the lectures, and your attendance and participation in your discussion section will be evaluated by your TA based on 1) your ability to discuss reading assignments and answer study questions, 2) turning in printed out homework assignments when due, and 3) individual and group presentations, both scheduled and spontaneous. Completing the reading and attending the lectures is necessary for successful participation in discussion sections.

This class is cross listed in Environmental Studies, Anthropology and Geography. You can register under any of these departments regardless of your major. You must register for one of these sections to take this class, and **YOU ARE REQUIRED TO ATTEND THE SECTION YOU ARE REGISTERED FOR** attendance will be taken, and if you do not attend, you will not receive credit for section. If you arrive late you will receive partial credit.

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<td>F</td>
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<td>HSSB 1228</td>
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*The first day of classes* is Thursday, September 22, and all sections will meet on September 22 and 23 (Thursday and Friday) for the full 50 minute period.

2.5. QUIZZES, FINAL
The best way to prepare for the quizzes and final exam is by 1) taking notes on the lectures, discussion sections, and readings, 2) using these notes to answer the study questions which will be handed out, 3) asking questions and participating in discussions during the lectures and discussion sections, 4) contacting the instructors outside of class if you have any remaining questions. Quiz and exam questions will be a mixture of objective, short essay, and long essay, and will be based on the study questions and module questions. Most multiple choice questions will ask you to identify the one answer that is MOST FALSE.

**Quizzes and exams will not be given early, and make-ups will be given only in documented cases of emergency.** Check your academic, athletic and social schedules for the quarter, and make sure there is not a conflict. This includes planning your class schedule so that your finals do not conflict and so that you do not have too many finals on one day. If you have a conflict, talk to your instructors now to see if arrangements can be made, or drop this course.

From the Registrar about Final Exam schedule: “According to Academic Senate policy, instructors are not authorized to change these times without prior Academic Senate approval. Students can personally contact the chair of the department about any hardship they experience from a change in the final exam schedule. Contacting the Undergraduate Council is also an option. Any such appeals should be made prior to taking the exam.”

2.6. COMPUTER & INTERNET ACCESS AND COMPETENCY
Access to and use of the internet for this class is required. All class materials will be posted either on the class website ([http://es.ucsb.edu/faculty/cleveland/Courses/149/149intro.htm](http://es.ucsb.edu/faculty/cleveland/Courses/149/149intro.htm)) (readings, study questions, lectures) or on Gaucho Space (modules, module quizzes). To access the materials you will need a user name and password, which will be given out during the first week of classes. This includes checking for updated weekly assignments, and checking your UCSB email account daily. According to the Registrar, “U-Mail is the official student e-mail service used by instructors and University administration. All students are required to activate and maintain (e.g. make sure it is not over quota) their U-Mail accounts for the duration of their academic career at UCSB. If you choose to forward your U-Mail to another e-mail provider you are required to check and maintain that account.”

2.7. GETTING HELP
If you are having difficulty understanding any of the material in this course, please come to our office hours or schedule an appointment immediately! Bring your notes on the lectures and readings, and your answers to study questions relevant to topics you want to discuss.
In addition, a wide range of services is available at UCSB to support you in your efforts to meet the course requirements.

- Campus Learning Assistance Service: 893-3269. CLAS helps students increase their mastery of course material through course-specific tutoring and academic skills development. Check out the tutorial groups and drop-in tutoring schedules posted on the web site: www.clas.ucsb.edu. Sign up for services at the CLAS main office, Building 477 9-5 daily.
- Counseling & Career Services: (893-4411, www.counseling.ucsb.edu) offers counseling for personal & career concerns, self-help information and connections to off-campus mental health resources.
- Disabled Students Program: (893-2668, www.sa.ucsb.edu/dsp) DSP provides academic support services to eligible students with temporary and permanent disabilities. Please let us know if you require special classroom accommodations due to a disability. You must register with DSP prior to receiving these accommodations.
- This is a high quality on-line source we also recommend: Study Skills Self Help Information. 2008. Virginia Tech, Cook Counseling Center, http://www.ucc.vt.edu/stdyhlp.html

3. STUDENT EVALUATION

Evaluation will be based on your comprehension of all course material (assigned readings, films, lectures, modules and discussion), clearly organized writing and verbal presentations, and your ability to apply these skills to using theory and data to creatively and convincingly test your ideas/hypotheses.

Attendance in all lectures and discussion sections is required of all students. If you cannot attend you are still responsible for the material covered.

3.1. SCHEDULE AND POINT DISTRIBUTION

We will announce in lecture when homework and quizzes will be returned to you. You will have one week from that date to ask any questions about your grade; after that we will not discuss.

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<tr>
<th>DESCRIPTION</th>
<th>DATE GIVEN OR DUE</th>
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<tbody>
<tr>
<td>Quizzes (100 points each, highest three grades counted)</td>
<td>Tuesdays, in lecture, Weeks 3, 5, 7, 9</td>
<td>300</td>
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<tr>
<td>Final exam (in lecture room)</td>
<td>Tuesday, December 11, 8-11 a.m.</td>
<td>360</td>
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<tr>
<td>Introductory essay (1-2 pp.)</td>
<td>Week #2</td>
<td>40</td>
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<tr>
<td>Module assignments (15 points each)</td>
<td>Weeks #2-8, 10</td>
<td>120</td>
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<tr>
<td>Discussion sections (20 points/week)</td>
<td>Weeks #2-8, 10, 11</td>
<td>180</td>
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<tr>
<td>Optional extra credit</td>
<td>Due by week #10 in your section</td>
<td>30</td>
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<td>TOTAL</td>
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3.2. GRADING SYSTEM

Your grade will be a result of your work and improvement during the course. Grading is not on curve. All students can earn an “A” or a “C”… or an “F”.

You will receive a “0” for any exam, paper or discussion section you miss. Assignments will be marked down one letter grade for each day they are late. The only exception will be for documented emergencies.
4. COURSE SCHEDULE

The schedule includes required readings, and dates for exams and paper assignments. Assigned readings are tentative are listed in the approximate order in which they should be read. Where no pages are listed, read the entire selection. Details will be added, and some changes will be made as we progress through the quarter, so always refer to the class website for the current week’s readings, study questions, quizzes and assignments for discussion sections.

The readings for this course are available on the course website. Most of the readings are chosen from the professional literature and require critical concentrated attention, i.e. they are not popular summaries. Section assignments, modules and module questions will be through Gaucho Space.

4.1. Part 1. The world food crisis: problems and solutions

Week 1. The world food crisis (WFC).

Thursday, September 27. Introduction to this class. The world food & agriculture crisis: How do we think about it? What do we do about it?

Readings

Syllabus.

Critical Analysis Guidelines (CAG). Focus on 1-4 for now.


Module

Module 1: Food Crisis: The world and Santa Barbara County.

Sections: Thursday, September 27, Friday September 28

Introductions; getting organized. Module 1 discussion.
Week 2. Evolution of the WFC: Population, agriculture & environment—the last 12,000 years.

Tuesday, October 02. Population – food dynamics.
Readings
Module
Module 2: Population growth in the world and Santa Barbara County.
Videos

Thursday, October 04. Agricultural revolutions. Do we need a new one…which one?
Readings
Sections
**Introductory essay due.
Preparation for Q#1
Module 2 due.


Tuesday, October 09. Emphases in defining sustainable agriculture; Economic emphasis.
**Quiz #1**
Readings
Module
Module 3. Sustainable agriculture and the production function.

Thursday, October 11. Environmental, economic & social emphases in sustainable agriculture; Synergy and conflict.
Readings
Sections
Module 3 due.
4.2. Part 2. Agrifood cycles and HCC


**Tuesday, October 16. Human carrying capacity.**

**Readings**


**Module**

Module 4 HCC.

**Thursday, October 18. Struggles over land and water for agriculture in Santa Barbara County**

**Readings**


**Sections**

Quiz #2 preparation.

Module 4 due.


**Tuesday, October 23. Agricultural carbon cycles, food system structures and climate change.**

**Quiz #2**

**Readings**


Pachauri, R. 2008. Global warning! The impact of meat production and consumption on climate change. London (http://www.ciwf.org.uk/includes/documents/cm_docs/2008/l/1_london_08sept08.pps#564,1)

**Module**

Module 5. Agriculture, food and climate change: calculating carbon footprints.

**Thursday, October 25. Agricultural nitrogen cycles, food system structures and climate change.**

**Readings**


**Sections**

Module 5 due.

**Monday, October 24. FOOD DAY.**

**Tuesday, October 30. Diet and the WFC**

*Readings*


*Module*

Module 6. Food Insecurity in the World, the U.S. and Santa Barbara County.

**Thursday, November 04. Localizing the SBC agrifood system.**

*Readings*


*Sections*

Quiz #3 preparation.  
Module 6 due.

4.3. Part 3. Implementing sustainable agrifood solutions in complex systems

Week 7. Farmer knowledge, and the management of common pool resources.

**Tuesday, November 06. Common pool resources and common property management.**

**Quiz #3**

*Readings*

Module 7. Common pool resource management.

**Thursday, November 08. Farmer and scientist knowledge**

*Readings*


*Sections*

Module 7 due.

Week 8. Plant Breeding and Agricultural Biotechnology.

**Tuesday, November 13. Plant breeding and the world food crisis.**

*Readings*


*Module*

Module 8. Plant breeding and biotechnology: hybrid maize.

**Thursday, November 15. Transgenic crop varieties and the risk management process.**
Readings
http://www.betterfoods.org/Promise/Promise.htm

Sections.
Module 8 due.


Tuesday, November 20. Diversity, polycultures, yield and yield stability.
**Quiz #4**
Readings

Module
Module 9. Managing agricultural ecosystems: polyculture and the LER.

Thursday, November 22. Thanksgiving. No class.

Sections.
No sections this week.

Week 10. Ecosystems management (cont.)

Tuesday, November 27. Soil diversity, organic agriculture and beyond.
Readings
USDA, National Organic Program (NOP). 2009. Program Standards, especially Production and Handling. Read in Subpart C (Production and Handling Requirements) sections 205.200 to 205.206, in the Electronic Code of Federal Regulations (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?type=xml&c=ecfr&cc=ecfr&sid=4163ddc3518c1ffdc539675aed8efe33;region=DIV1;q1=national%20organic%20program;rgn=div5;view=text;idno=7;node=7%3A3.1.1.9.31).
Demeter Association Inc. 2009. see (http://www.biodynamics.com/biodynamics.html re. biodynamic program, and ) and http://demeter.net/demeter/ for “Demeter certification/Procedures”.

Thursday, November 29. Sociocultural diversity.
Readings
Campbell, BM, Bradley, P, and Carter, SE. 1997. Sustainability and peasant farming systems: observations from Zimbabwe. Agriculture and Human Values 14:159-68.

Module
Module 10.

Sections.
Module 9 due.

Week 11. Review & preview.

Tuesday, November 29. The reproductive commons and sustainable agrifood systems: demand plus supply side solutions.
Readings

Thursday, December 1. What does what we know tell us about what we can do? Review of the quarter. Open question session.

Sections
Final Exam preparation.

Week 12. Finals Week
**Final Exam**, Tuesday, December 11, 8-11 a.m., TD 1701.