

Appalachian State University, Department of Interdisciplinary Studies  
**IDS 3251-101 Principles of Agroecology** (3 credits)  
**IDS 3251-201/202/203 Agroecology lab** (1 credit; required)

**Lecture:** Tuesday and Thursday, 12:30 - 1:45pm      **Room:** 223 LLA

**Lab:** Tuesday, Wednesday OR Friday 2:00 - 4:30pm      SD Teaching & Research Farm, Valle Crucis

**Instructor:** Christof den Biggelaar, Ph.D., 217 LLA, phone 262-7268, [denbiggelaar@appstate.edu](mailto:denbiggelaar@appstate.edu)

**Graduate Assistant:** Marc Williams, 209 LLA, phone 262-7234, [italmon@hotmail.com](mailto:italmon@hotmail.com)

**IDS main office:** 262-3177

**Office hours:** Thursday and Friday 8:30 - 11:30am, and by appointment. Office hours are not scheduled to keep faculty occupied, but to provide students an opportunity to drop by with questions they are too embarrassed to ask in class, get additional explanations about the subject matter, ask questions about what and how to prepare for class, what the assignments are all about, for help with the mid-term project, whatever. So, make use of the opportunity.

### **General outline**

This course will focus attention on agricultural systems from an ecological perspective, and how such systems can contribute to a more sustainable society. Topics covered in the class will include basic ecological concepts (*i.e.*, the biological, chemical and physical factors and their interactions and how they affect plants/crops) and their application to agricultural systems; production and consumption aspects of food systems; and ways to facilitate the promotion of sustainable agriculture.

### **Required background**

A junior standing (or permission of the instructor) is required to ensure adequate exposure to basic ideas related to science, and social and political institutions. Courses which provide the necessary understanding of basic environmental factors affecting plants, natural cycles, regenerative processes, and/or the economic, political and institutional factors affecting agricultural sustainability will be helpful but are not required.

### **Course objectives**

The educational objective of this course is to learn about and understand the theoretical underpinnings of sustainable agriculture. Students successfully completing the course should be able to:

1. Demonstrate an understanding of biophysical factors affecting plants and ecological processes of crop communities and farm ecosystems, as well as how to manipulate those factors and processes for successful and sustainable food and fiber production.
2. Know how cultural, economic and political institutions affect production and consumption decisions at the individual, community and society level.
3. Be able to apply basic scientific principles and information on which regenerative agricultural practices are based.
4. Be able to work cooperatively with others and participate effectively in class discussions and assignments.

### **Class format**

The class will meet two times a week for 75 minute lectures by the instructor and/or guest lecturers, as well as (group) presentations and discussion by the students. Students are required to attend one of the lab sessions in conjunction with the lecture portion of the course. Attendance and *active* participation (meaning, having read assigned readings BEFORE each lecture, significant engagement in discussions, getting sweaty and your hands dirty in the lab portion) in all class activities is essential and required.

### **Other important considerations**

1. Students are expected to be aware of and follow the ASU's current "Code of Academic Integrity."
2. Everyone automatically qualifies for an "F" in this course; it is up to you to prove that you deserve a better grade than that (in other words, I grade courses from the bottom up, not from the top down). The course is graded on a Bell-curve (normal distribution), meaning most students will get between a B and C grade. Incomplete grades are generally not given, and are granted solely at the instructor's discretion.
3. Papers are due at the scheduled beginning of class, and attendance is taken at that time. Three unexcused absences automatically translates into an "F". Lateness to class and/or lab will result in reduced credit; two 'lates' means one absence.
4. Class starts promptly at 12:30pm. Lateness means not only that you are missing part of the course, but disrupt it for others and the instructor. So, be prepared to find the door closed; see also #3.
5. It is expected that students read assigned materials BEFORE the scheduled class time, and be prepared to ask questions about the material. Don't be passive learners! Take responsibility for your own learning, it much more fun for you, and for me to teach!
6. The van that takes students to the lab in Valle Crucis leaves promptly at 2pm on Tuesday. For the Wednesday and Friday labs, students will need to make their own way to the farm (car pool as much as possible). If you're late arriving at the farm, you will be considered absent from the lab.
7. If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Services, 222 D.D. Dougherty, 262-3053/262-3056 (TTY) as early as possible in the term.

## **LECTURE**

### **Text and readings**

1. Gliessman, Stephen R. 1998. *Agroecology: Ecological Principles in Sustainable Agriculture*. Boca Raton, FL: Lewis Publishers (*NOTE: this is a rental textbook*)  
Additional information, incl. case studies may be found on the agroecology website maintained by the Agroecology program at UC-Santa Cruz (<http://www.agroecology.org/>).
2. Clemens and Anil Shrestha. 2004. *New Dimensions in Agroecology*. Haworth Press.
3. Current articles and related readings may be assigned as deemed appropriate as supplemental reading for this course. Students are encouraged to bring appropriate material and share it with the class.

### **Assignments/projects**

Short, in-class writing assignments or quizzes pertaining to the readings for that particular week and/or prior lectures/discussion may also be given without warning.

#### Local Food System Project

Cooperation and collaboration are more common in nature than competition (as you will learn in this course), and are also a key aspect of sustainability. Therefore, as part of the course, students will work together in a project that is part individual and part collaborative.

The project this year involves one aspect to assess the local food system: How local is it? Is local more expensive than far-away food? Is organic more expensive or not? And there are probably other questions that one can come up with to determine the nature of the food we eat.

A. The first part of this project is an individual assignment, to be completed and turned in on October 9 (=before Fall Break).

1. Make a typical (average) grocery list of things that you usually eat/drink during the week.
2. Go shopping for those items, using at least three different venues (regular grocery store, farmers' market, organic/natural food store). At times, you may not be able to find all the items you want in one location (not much can be done except to go somewhere else, but note the details), or some items in a

certain location may exceed your budget (in which case, gather the relevant info with as much detail as possible without buying the item(s)).

3. For each item, note the price, weight of item (so that you can standardize the price per pound or ounce or whatever common unit), the origin of the item (where was it grown, produced, # of frequent flyer miles or frequent highway miles the item qualifies for, ...), nature of the item (organic, conventional, biotech food, ...), brand (and, if you can, which corporation really owns that brand).
4. Organize the information you have obtained in some orderly fashion so that you can compare and contrast between the different outlets where you shopped.
5. Write a 2 page (maximum) summary of what you have learned from this exercise.

B. Group portion of the exercise: Information about this part will be given to you later.

#### Commentaries on current events:

Each student is required to write two commentaries (in the format of a newspaper editorial) on current events in the news (radio, TV, newspapers or news magazines) related to agroecology and sustainable agriculture/food systems (NOTE: *Current* means published during the semester, so between Aug 20, 2007 and when the commentary is due). Commentaries should be a *maximum* of 400 words in length (about 1 page, single spaced is OK), and should be accompanied by a print out/copy of the news story which you are commenting on (include source and date). Note that a commentary is NOT a summary!! The first commentary is due Tuesday Oct 2, the second on Thursday Nov 1.

#### Sustainable Agriculture Conference

The annual CFSA Sustainable Agriculture Conference will take place November 9-11 in Durham, NC. You can earn extra credit if you participate. I will be driving a car or van to Durham. Work-exchange opportunities and a limited number of scholarships exist (but you have to sign up for these early!!!); student rates for the event are \$125 including breakfast-lunch-dinner and receptions, and you can earn up to \$70 by volunteering. This early bird rate is valid until August 31, thereafter it will be \$150 until Nov 7. You can register on-line at [carolinafarmstewards.org](http://carolinafarmstewards.org).

#### Final exam:

This will be a comprehensive final exam consisting of short answer and essay questions; the exam will cover material from the entire semester from both class and lab.

#### **Requirements for written papers**

1. Written papers are graded on scholarly quality, mastery of the material, conciseness, organization, use of readings, grammar and spelling. Style will be a consideration in grading.
2. Papers must be word-processed; title pages, plastic covers etc. are **not** required (think sustainably!). Diagrams, drawings, and tables may be used as appropriate; these can be done by hand if you have not (yet) mastered computer graphics.
3. All assignments, quizzes, exams etc. in this course must be completed and turned in to receive a passing grade for the course. Any assignments turned in late will receive a lower grade; assignments turned in more than one week past their due date will automatically get a grade of "F". However, **all** assignments must be turned in or be completed to receive a passing grade for the course.
4. If any of the unannounced quizzes are missed due to absence, no opportunity will be given to make them up at a later date unless students have a valid reason for such absence (the validity of which is up to the discretion of the instructor).
5. Written assignments can be handed in in printed form, or e-mailed to the instructor (see e-mail address on page 1 of this syllabus). If you choose the latter, such papers should be received by the instructor no later than 5 PM on the day they are due for them not to be considered "late."

#### **Class schedule**

<u>Date</u>	<u>Topic</u>	<u>Readings/assignments</u>
Aug 21	Volunteering or interning at the farm – Brooke Cuttino, farm manager	
Aug 23	Course introduction and overview: The need for sustainable food systems	Chapter 1
Aug 28	The plant	Chapter 3
Aug 30	Light	Chapter 4
Sep 4	Temperature	Chapter 5
Sep 6	Humidity, rainfall	Chapter 6
Sep 11	Wind	Chapter 7
Sep 13	Soils	Chapter 8
Sep 15	Cove Creek Farm Heritage Day	
Sep 18	Soil fertility and soil management	Chapter 8
Sep 20	Video: Soil erosion: Will the world starve?	
Sep 25	Soil water	Chapter 9
Sep 27	Biotic factors	Chapter 11
Oct 2	Fire and The environmental complex	Chapters 10+12 <i>First commentary due.</i>
Oct 4	Crop (population) ecology	Chapter 13
Oct 9	Genetic resources	Chapter 14 <i>Individual part of local food systems project due</i>
Oct 11	Fall break	
Oct 16	Video: Harvest of Fear (Part I).	
Oct 18	Community ecology: Species interactions	Chapter 15
Oct 23	(Agro)ecosystem ecology: Diversity and stability	Chapter 16
Oct 25	Agroecosystem management: Disturbance and succession	Chapter 17
Oct 30	Video and discussion: My father's garden	
Nov 1	Energy issues in agroecosystems	Chapter 18 <i>Second commentary due</i>
Nov 6	Discussion of the findings of the group assignment portion of the course project	
Nov 8	Agroecosystems and natural ecosystems	Chapter 19

Nov 9-11	22d Annual Sustainable Agriculture Conference, Marriott Hotel and Conference Center, Durham, NC	Extra credit given
Nov 13	Converting to ecologically-based management, and how to measure sustainability	Chapter 20
Nov 15	Video and discussion: The politics of food - International dimensions	
Nov 20	Agriculture, food systems and sustainability	Chapter 21
Nov 22	Thanksgiving	
Nov 27	The politics of food - Local dimensions	
Nov 29	So, what the heck are agroecosystems and agroecology??	Chapter 2 Clements & Shresta, Chap. 1.
Dec 4	A review of the course and lab	
Dec 6	Comprehensive final exam, 3 - 5:30pm	

### **LABORATORY**

**Labs:** 201- Tuesday 2:00 - 4:30, instructor Christof den Biggelaar  
 202 - Wednesday 2-4:30, instructor Marc Williams (grad assistant)  
 203 - Friday, 2:00 - 4:30, instructor Christof den Biggelaar

**Location:** SD Teaching & Research Farm and/or Agroecology lab (under the Apple Barn) in Valle Crucis

On **Tuesday**, a van will take students to and from the lab site. The van will leave at 2 PM sharp to take students to the field site; we usually leave at 4:30 from the site, to be back at ASU by 5 pm. As few students made use of the van in the past on **Wednesday and Friday**, students will need to drive themselves (carpool!!). It is approx. 10 miles between the LLC and the farm (15 minutes drive).

#### **Description**

This hands-on laboratory course has two main activities:

1. The Fall lab involves a lot of harvesting, maintenance (weeding, pest control), planting and seeding of Fall/Winter crops (both to eat and to protect or enrich the soil), composting, cold frame construction, and bedding down the garden for the winter. Observation and farm record keeping are essential for a gardener, and that will be part of your tasks as well.
2. Students will collect and analyze data to learn about basic biophysical and ecological data of Dutch Creek farm (vegetation, soils, hydrology, fauna (insects, birds, mammals both in and above the soil), climate), and the social, economic and cultural aspects of farming in Watauga County (through farm visits and required peripheral activities/assignments). At the end of the semester, students should be able to relate this information to, and use it for, the operation of the farm on a sustainable basis.

**Attendance and active participation in all lab activities is essential and required!**

#### **Objectives**

At the end of the semester, students should be able to:

1. Demonstrate basic knowledge and principles of crop production, and ecological and social inventory and data collection methods for planning agricultural activities, and be able to apply this information to

- determine which crops to grow where and when, and how.
2. Demonstrate basic knowledge of gardening techniques and practices, including soil and seedling preparation; direct seeding; fertilization; pest, disease and weed control; composting; harvesting and post-harvest handling, etc. The specific practices and techniques to be learned will depend on the time of year, crops to be grown, and crop requirements and needs.
  3. Be able to work cooperatively with others and participate effectively in class discussions and assignments

### **Important considerations**

The lab will consist almost entirely of hands-on field work, and will take place rain, snow or shine. Wear work clothes or ones you don't mind getting muddy or torn, and be prepared for inclement weather (wear layers), etc. Although students like to work on their tans when outside (coming to the lab in shorts and flip-flops), there are thorny bushes and barbed wire on the farm (you may be working around both), broken glass and old nails in the soil, and some tools and equipment can cause cuts and scrapes; therefore, sturdy work boots and jeans are NOT a luxury!!!

### **Texts**

#### Required

Laboratory course materials are available on-line in PDF and/or Word/Excel formats and can be found on my website at [appstate.edu/~denbiggela/](http://appstate.edu/~denbiggela/)

#### Recommended

Jeff Ball et al., 1995, Rodale's Garden Problem Solver: Vegetables, Fruits and Herbs. Emmaus, PA: Rodale Press.

Barbara Pleasant et al., 1996, The Gardener's Weed Book: Earth-Safe Controls. Pownal, VT: Storey Publishing.

Additional hand-outs and relevant articles, tbd.

### **Assignments**

1. Students are required to keep a lab journal in which they write their own observations and interpretations of what they have seen, done and learned.
2. Selected lab topics/sections (e.g., soils, vegetation, nutrient cycling) will have their own data collection sheets, information on data analysis and questions to answer in the lab manual. *These will need to be completed and turned in at the beginning of the following week's lab.* Only one report need to be turned in for the group you worked with that week (but list the name of all group members).
3. Students are required to register all observations, equipment breakdowns, notes about the various vegetables (yields by date and variety; diseases, pests, etc.; amounts eaten and/or donated to Hospitality House/Hunger Coalition) in a farm notebook that will be provided and left on the farm.
4. Each student will be assigned ONE garden bed to assess its soil health and develop a plan (incl. crop rotations) for its management to improve or maintain soil health as needed. The Soil Quality Manual can be found on my website, as are links to other relevant documents.
5. Periodically, instructor(s) may provide relevant articles; each student should read and turn in a one page (max) summary of the article the following lab period.
6. Attend the farmers' market at least twice during the semester, and talk to some of the farmers/vendors to learn about the social, cultural and economic aspects of small farming in the area. We will visit some local farms as well, providing additional opportunities to gather this information. Write about your impressions of the market and what you learn from your farmer talks in your journal. The farmers' market is held each Saturday morning 7:30-noon at Horn in the West until the end of October.
7. Cove Creek Farm Heritage Day is September 15 at the old Cove Creek High School in Sugar Grove. As a class project, students are to put together displays to design and man a stand with produce from the farm; help set up and clean up at the event, take tickets, or otherwise help exhibitors/event organizers (peeling apples and stirring the pot for the apple butter making, help with the seed exchange, ....).

### **Schedule**

There is no specific lab schedule of activities (except the planting of garlic in week 3/4 of October), as activities depend on the weather and requirements of the crops, animals, and needs of the farm.

As there are an uneven number of Tuesday's, Wednesday's and Friday's in the semester because of Fall break and Thanksgiving, there will be NO LAB on Tuesday Aug 21 and Dec 4, and Wednesday Nov 28. The latter two dates will be used for make-up labs IF YOU MISSED A LAB EARLIER FOR A VALID REASON (according to ASU policies) ONLY!!!

For those in the Friday lab and NOT going to the Sustainable Agriculture Conference, an independent work assignment will be given for the Friday Nov 9 lab period.

### **Grading**

Lecture portion:	Class attendance and participation	10 %
	Group project	25 %
	Commentaries	20 %
	In-class writing assignments/quizzes	20 %
	Final exam	25 %
Lab portion	Participation	25%
	Attention to detail and accomplishment of tasks	25%
	Lab journal	25%
	Lab assignments	25%

Total course points 135 (lecture 100 points, lab 35 points); less than 70% ( $\leq 94.5$  points) in this course translates into "F".