

## ALS 5155 – Global Agroecosystems

### INSTRUCTORS

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**OFFICE HOURS:** By appointment.

**COURSE OFFERED:** Every Fall Semester, distance education only.

**TIMES:** Lectures and other materials will be posted directly on canvas, using an asynchronous delivery approach. There will be a synchronous 1-h chat session held on Monday between 5:00 PM and 6:00 PM, every week or every other week. Attendance to chat sessions is not mandatory but highly encouraged; all chat sessions are recorded.

**CREDIT HOURS:** 3

### PREREQUISITES (can be waived with instructor approval)

ALS 5155: Soil for Environmental Professionals (SWS 5050) or Introduction to Soils in the Environment (SWS 3022), Applied Field Crop Production (AGR 4214C), and Agricultural Ecology (ALS 3153), or equivalents, or approval by the instructors.

### COURSE DESCRIPTION

This course focuses on the principles of agroecology and presentation of topics that integrate ecological with agricultural principles to optimize resource conservation, productivity, societal benefit, and profitability.

### COURSE OVERVIEW

There is a need for students to be trained broadly in agriculture, including agriculture's role in ecology as farming systems become more complex. This context is found in the "triple bottom line" of economics, environment, and society that complement production when evaluating the sustainability of farming systems. This course will emphasize a greater understanding of this triple bottom line in agricultural production in an ecosystem context, often termed agroecology. It will focus on the global trends of increasing population and land-use pressure; diminishing soil, water, nutrient, and energy resources; concern over the negative impacts of agricultural production on the environment; increasing awareness of the potential ecosystem service benefits from agriculture; and interactions with socio-economic concerns.

## **COURSE OBJECTIVES**

The overall objectives of the course are to provide students with:

- 1) a thorough understanding of the complex interactions that occur in agroecosystems;
- 2) the ability to apply this knowledge to the design and management of sustainable agricultural production systems across the world.

## **STUDENT LEARNING OBJECTIVES**

Following this course, students are expected to be able to:

1. Describe global agricultural production systems and their role in facing the challenge of global change.
2. Evaluate and discuss agricultural production issues from environmental, economic, and societal perspectives.
3. Analyze research literature dealing with the sustainability of agriculture.
4. Synthesize and apply the knowledge gained in this course to assess emerging agricultural production systems.
5. Use principles learned in this course to synthesize and evaluate a relevant and timely global issue in agroecology.

## **CLASS FORMAT**

Lectures and other materials will be delivered directly on canvas, one week in advance (typically on Friday). There will be a synchronous 1-h chat session held on Monday between 5:00 PM and 6:00 PM. There will be eight online discussion sessions managed in Canvas throughout the semester.

## **TEXTBOOK**

No textbook is required but the following readings will be assigned for each discussion:

Discussion #1: Brym, Z.T., and Reeves, R.R. 2016. Chapter 5: Agroecological Principles from a Bibliographic Analysis of the Term Agroecology. *Sustainable Agriculture Reviews*. 19: 203-231.

Discussion #2: Foley, J.A., et al. 2011. Solutions for a cultivated planet. *Nature*. 478: 337-342.

Discussion #3: Drinkwater, L.E., and Snapp, S.S. 2007. Nutrients in Agroecosystems: Rethinking the Management Paradigm. *Advances in Agronomy*. 92: 163-186.

Discussion #4:

Luo, Z., et al. 2010. Can no-tillage stimulate carbon sequestration in agricultural soils? A meta-analysis of paired experiments. *Agriculture, Ecosystems and Environment*. 139: 224-231.

Poeplau, C., and Don, A. 2015. Carbon sequestration in agricultural soils via cultivation of cover crops – A meta-analysis. *Agriculture, Ecosystems and Environment*. 200: 33-41.

Discussion #5: Stanley, P.L., et al. 2018. Impacts of soil carbon sequestration on life cycle greenhouse gas emissions in Midwestern USA beef finishing systems. *Agricultural Systems*. 162: 249-258.

Discussion #6: Billeter, R., et al. 2008. Indicators for biodiversity in agricultural landscapes: a pan-European study. *Journal of Applied Ecology*. 45: 141-150.

Discussion #7: Beuchelt, T.D., and Zeller, M. 2011. Profits and poverty: Certification's troubled link for Nicaragua's organic and fairtrade coffee producers. *Ecological Economics*. 70: 1316-1324.

Discussion #8: Seufert, V., and Ramankutty, N. 2017. Many shades of gray – The context-dependent performance of organic agriculture. *Science Advances*. 3: e1602638.

The following references are additional useful resources for the course:

Altieri, M.A. 1995. *Agroecology: The science of sustainable agriculture*, second edition. Westview Press, Boulder Colorado.

Jackson, L.E. 1997. *Ecology in agriculture*. Academic Press, San Diego, CA.

Scherr, S.J., and J.A. McNeely (eds.). 2007. *Farming with Nature: The Science and Practice of Ecoagriculture*. Island Press, Washington, DC.

Sinclair, T.R., and A. Weiss. 2010. *Principles of Ecology in Plant Production*, 2<sup>nd</sup> edition. CAB International. 186 pp.

Sinclair, T.R. and C.J. Sinclair. 2010. *Bread, Beer and the Seeds of Change: Agriculture's Imprint on World History*. CAB International. 288 pp.

Vandermeer, J.H. 2010. *The ecology of agroecosystems*. Jones & Bartlett Learning, Sudbury, MA.

Wojtkowski, P.A. 2006. *Introduction to agroecology: Principles and practices*. Psychology Press, Binghamton, NY.

**SPECIAL SOFTWARE:** None required.

## **E-LEARNING**

The entire course will be managed through e-learning using Canvas, and all materials and content will be available fully online, through Canvas. Canvas is the online source for the majority of your learning resources and assignments in this course. Students enrolled in the course should login to Canvas on the first day of the course at: <https://elearning.ufl.edu>. You will use your Gatorlink name and password to login to Canvas.

## **TOPICAL OUTLINE**

The following topics will be covered during this class, with a more detailed description available in Canvas. Weeks when individual topics are covered are subject to change.

- Module 1: Introduction
  - Introduction to the class & agroecology (week 1)
  - History of agriculture & major food crops (week 2)
- Module 2: Production

- Productivity & yields (week 3)
- Water & pests (week 4)
- Soils & nutrient cycling/management (week 5)
- Tillage, cover cropping & intercropping (week 6)
- Module 3: Environment
  - Soil health & agroforestry (week 7)
  - Water quality & use (week 8)
  - Grassland ecology & management (week 9)
  - Biodiversity & pollinator ecology (week 10)
- Module 4: Society & Economics
  - Economics introduction (week 11)
  - Other economic considerations (week 12)
  - Diversity & diet (week 13)
- Module 5: Synthesis & Integration
  - Alternative systems (week 14)
  - Sustainable intensification & climate change (week 15)
  - International case studies & review (week 16)

## EVALUATION OF STUDENTS

The class is graded on a point scale, totaling **1000 points**, using three main assessment types:

- Biweekly discussions on assigned readings. Students will post a question for the class to discuss for all assigned scientific readings during the semester and post two original replies to other students' questions. Questions and replies should be between 50 and 150 words and encompass elements from the original paper or other sources from the literature. There will be a question to answer in the subsequent exam for each paper assigned. Each discussion is worth 20 points (10 points for questions, 5 points for each reply) x 8 discussions = **160 points total**.
- Three exams. Students will complete exams online through Canvas, and these will be open from Sunday 12:01 AM until Wednesday 11:59 PM. These exams are open book, but you have to provide your own work. Exams consist of short answers related to a case study evaluated with the scorecard, in addition to a few questions incorporating key concepts from assigned readings. Exams are weighted as **150, 150, and 200 points = 500 points total**.
- Major paper. Students will write a paper focusing on a given system according to production, environment and socio-economic components. An outline will be due mid-September (40 pts), a first draft late October (125 pts), and a final version incorporating feedback will be due in early December (175 pts). The major paper is worth **340 points total**.

**GRADING**

We will use the following grading scale for the course:

Points	Grade	Grade points
940 – 1000	A	4.0
900 – 939	A-	3.67
870 – 899	B+	3.33
830 – 869	B	3.0
800 – 829	B-	2.67
770 – 799	C+	2.33
730 – 769	C	2.0
700 – 729	C-	1.67
670 – 699	D+	1.33
630 – 669	D	1.0
600 – 629	D-	0.67
< 600	E	0

For information on current UF policies for assigning grade points, see:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**ONLINE COURSE EVALUATION**

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

**ABSENCES AND MAKE-UP WORK**

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [Click here to read the university attendance policies.](#)

**ACADEMIC HONESTY**

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: “*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*”

**It is assumed that you will complete all work independently unless the instructor provides explicit permission for you to collaborate on course tasks.** Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic

misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.

## **SOFTWARE USE**

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

## **STUDENT PRIVACY**

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [Notification to Students of FERPA Rights](#).

Our chat sessions will be visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the “chat” feature, which allows students to type questions and comments live.

## **SERVICES FOR STUDENTS WITH DISABILITIES**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## **IN-CLASS RECORDING**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student

participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

## CAMPUS RESOURCES

### Health and Wellness

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care](#) website to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

*GatorWell Health Promotion Services:* For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

### Academic Resources

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

*Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

*Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

*On-Line Students Complaints:* [View the Distance Learning Student Complaint Process.](#)