

# AGROECOLOGY (AGROECOL)

## **AGROECOL/C&E SOC/ENTOM/ENVIR ST 103 – AGROECOLOGY: AN INTRODUCTION TO THE ECOLOGY OF FOOD AND AGRICULTURE**

3 credits.

Agroecology has blossomed across the world in recent decades as not only a science, but also a practice, and a movement. Employ the multiple disciplines and perspectives that Agroecology affords to analyze our agricultural and food systems within a broader context of dynamic social and ecological relationships.

**Requisites:** None

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Explain and analyze basic biophysical processes of agricultural ecosystems and the challenges and benefits of various management systems

Audience: Undergraduate

2. Interrogate social, economic, and political structures underlying agriculture at local, regional, national, and global scales

Audience: Undergraduate

3. Describe how they personally connect to local to global agricultural landscape as humans, ecological actors, food and fuel consumers, and thoughtful citizens

Audience: Undergraduate

## **AGROECOL 187 – PLANTS AND THE SCIENCE OF SURVIVAL**

3 credits.

Could you grow and gather enough food to feed yourself? Learn the biology behind how to grow healthy plants in a healthy ecosystem by creating plans for a large food garden. Focus on understanding the scientific method, analyzing data and sources, and using scientific research as a tool to make decisions. Identify credible information sources for solving unpredictable, real-world problems faced by food growers. Practice awareness and understanding of the natural world.

**Requisites:** None

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Summer 2025

**Learning Outcomes:** 1. Create an evidence-based plan for a growing space

Audience: Undergraduate

2. Explain how the structure, function, growth, origin, evolution, distribution, and taxonomy of plants impact humans' use of them as food and medicine

Audience: Undergraduate

3. Demonstrate knowledge of scientific concepts and assumptions as they apply to growing and harvesting plants

Audience: Undergraduate

4. Analyze, interpret, and locate scientific evidence about homesteading-related topics

Audience: Undergraduate

5. Demonstrate knowledge of the scientific method

Audience: Undergraduate

6. Apply scientific reasoning to determine when scientific information supports a given conclusion about plant use and production

Audience: Undergraduate

7. Critically evaluate the impacts of plant sciences on our communities and food systems

Audience: Undergraduate

**AGROECOL/HIST SCI 301 – (HORTI)CULTURAL ROOTS: HUMAN HISTORIES OF PLANTS AND SCIENCE**

4 credits.

Dig into the history of plant sciences to understand why plants and humans have the relationships they do today. Focus on the experiences of Indigenous Americans and People of Color to understand the roots of inequities in horticulture, agriculture, and other plant sciences. Practice skills as a translator of science and history through engagement with scientific publications, library resources, and archival materials. Define important societal questions, collect and analyze evidence, present original conclusions, and contribute to ongoing discussions about the relationship of people and plants.

**Requisites:** Satisfied Communications A requirement

**Course Designation:** Gen Ed - Communication Part B

Breadth - Humanities

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Compare and contrast plant-human systems in multiple historical contexts with an emphasis on the impact of racism

Audience: Undergraduate

2. Produce written and spoken work that incorporates critical reading, logical thinking, and use of evidence that is appropriate to the plant sciences

Audience: Undergraduate

3. Recognize ethnic, racial, and religious minorities' historical and ongoing marginalization in horticulture, agriculture, botany, and other plant-related disciplines

Audience: Undergraduate

4. Effectively participate in a multicultural society through written and spoken contributions to ongoing discussions

Audience: Undergraduate

5. Translate current research into a written and spoken format that is relevant and understandable to a public audience and scholars in other disciplines

Audience: Undergraduate

6. Apply core library resources to research and communication about human-plant systems

Audience: Undergraduate

**AGROECOL 303 – AGROECOLOGICAL SYSTEMS: WORKING TOWARDS SUSTAINABILITY**

3 credits.

Explores in-depth agriculture systems as coupled ecological and social complexities. Examines the components of agricultural systems and analyzes how different ecological and social contexts influence and are influenced by the agricultural system. Explores and analyzes how management decisions (crop breeding, in-crop management, landscape-level, etc.) ramify to influence processes and outcomes at different levels of complexity (e.g., ecosystem, landscape, social well-being, human health, economic) and the socio-ecological tradeoffs that ensue. Develops skills to analyze how the design and implementation of integrated agricultural systems can contribute to solutions for pressing societal challenges such as climate change, biodiversity declines, unsustainable resource use and social inequality.

**Requisites:** ENVIR ST/AGROECOL/C&E SOC/ENTOM 103

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Identify ecological biotic and abiotic aspects of agricultural systems as stocks and flows of energy and matter within and between organizational levels (e.g. cellular, organismal, ecosystem, landscape, and global)

Audience: Undergraduate

2. Describe the social dimensions of agricultural systems as stocks and flows of knowledge, information, and beliefs at organizational levels within agroecosystems

Audience: Undergraduate

3. Explain and analyze how the management of agroecosystems influences ecological and social processes

Audience: Undergraduate

4. Evaluate how agriculture can be designed and managed to be a solution for modern ecological and social challenges of today (e.g. climate change, unsustainable resources use, biodiversity declines, social inequality) in different socio-ecological contexts

Audience: Undergraduate

5. Compare and contrast careers in agroecology through interactions with a wide variety of persons working in the field, from practitioners to industry professionals

Audience: Undergraduate

6. Solve problems individually and as part of teams using the scientific method, logic, and reasoning by identifying and differentiating the strength and value of information, evidence, and approaches related to the management and sustainability of agroecosystems

Audience: Undergraduate

7. Reflect on one's participation in food systems from local to global scales

Audience: Undergraduate

**AGROECOL/ILS/RELIG ST 304 – PLANTS AND RELIGION**

3 credits.

Plants play an important role in just about every aspect of our lives and culture, including religion. Learn about the ways plants are used and understood in religions including Judaism, Christianity, Islam, and indigenous and pagan traditions. Apply theories from across the humanities to interpret plants and ecological themes in religious practices, works of art, literature, architecture, and gardens. Define important societal questions, collect and analyze evidence using primary sources, present original conclusions, and contribute to ongoing discussions about the relationship of people and plants. Think critically about the similarities and differences between your own use and understanding of plants and those of larger global communities.

**Requisites:** Satisfied Communications A requirement or graduate/professional standing

**Course Designation:** Breadth - Humanities  
Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S  
Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Learning Outcomes:** 1. Identify and employ various approaches to interpreting plants and ecological themes in religious works of art, literature, architecture, gardens, and practices.

Audience: Both Grad & Undergrad

2. Describe key concepts of world religions and how they have and continue to understand and incorporate plants into their traditions and beliefs.

Audience: Both Grad & Undergrad

3. Practice interpretative methods within multiple historical and cultural contexts.

Audience: Both Grad & Undergrad

4. Apply critical approaches to understanding in religious practices and beliefs and alternative ways of considering them.

Audience: Both Grad & Undergrad

5. Compare and contrast the complexities of one's own culture and larger global communities.

Audience: Both Grad & Undergrad

6. Extract and analytically summarize arguments from secondary source books on plants and religion.

Audience: Graduate

7. Develop an original humanities argument based on primary sources and using secondary sources to construct a framework.

Audience: Graduate

8. Analyze current academic debates about plants and religion across religious studies, history, folklore, sociology, and art history.

Audience: Graduate

**AGROECOL 370 – GRASSLAND ECOLOGY**

3 credits.

Understand factors driving global, continental, regional, and local distribution of grasslands. Discuss how management affects provision of grassland ecosystem goods and services. Compare and contrast plant community and ecosystem dynamics in native prairie and intensively managed pastures.

**Requisites:** PL PATH/BOTANY 123, BOTANY/BIOLOGY 130, SOIL SCI/ENVR ST 101, SOIL SCI/ATM OCN/BSE 132, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, BOTANY 100, PLANTSCI 110, AGRONOMY 100, ENTOM/AGROECOL/C&E SOC/ENVR ST 103, or graduate/professional standing

**Course Designation:** Level - Intermediate  
L&S Credit - Counts as Liberal Arts and Science credit in L&S  
Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Explain the social, economic, and environmental dimensions of the sustainability challenges of grasslands

Audience: Undergraduate

2. Describe the social, economic, and environmental dimensions of grasslands and identify potential trade-offs and interrelationships among these dimensions

Audience: Both Grad & Undergrad

3. Predict the distribution, structure, function, and services of grasslands from global to local levels of resolution

Audience: Graduate

**AGROECOL 375 – SPECIAL TOPICS**

1-4 credits.

Special topics on issues relevant to agroecology.

**Requisites:** None

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Explain concepts relating to an agroecology topic outlined in the title

Audience: Undergraduate

**AGROECOL 377 – GLOBAL FOOD PRODUCTION AND HEALTH**

3 credits.

Crops, food, and cropping systems from different parts of the world and their impact on global sustainability and health. Introduction to crop biology, environmental requirements, and agronomic production practices of major food crops. Environmental, socioeconomic, and health impacts of farming systems and how to assess their sustainability. A global perspective on agroecology, food, environment, health, and agriculture.

**Requisites:** BOTANY/BIOLOGY/ZOOLOGY 151, BIOLOGY/ZOOLOGY 101, BIOLOGY/BOTANY 130, BIOCORE 381, HORT 120, AGRONOMY 100, ENVIR ST/AGROECOL/C&E SOC/ENTOM 103, PLANTSCI 110, or graduate/professional standing

**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Describe, analyze, and understand cropping systems of different parts of the world.

Audience: Both Grad & Undergrad

2. Describe the social, economic, and environmental dimensions of cropping systems and identify potential trade-offs and interrelationships among these dimensions.

Audience: Both Grad & Undergrad

3. Analyze sustainability issues and/or practices using a systems-based approach within the Agroecology framework.

Audience: Both Grad & Undergrad

4. Reflect about engaging in international sustainable agriculture and health issues.

Audience: Both Grad & Undergrad

5. Communicate effectively ideas in written reports and oral presentations.

Audience: Both Grad & Undergrad

6. Use sustainability principles for developing personal goals and professional values.

Audience: Both Grad & Undergrad

7. Explain the social, economic, and/or environmental dimensions of the sustainability challenges of global food production systems and health.

Audience: Graduate

**AGROECOL 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION**

1-8 credits.

Internship under guidance of a faculty or instructional academic staff member in Agroecology and internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor.

**Requisites:** Consent of instructor

**Course Designation:** Workplace - Workplace Experience Course

**Repeatable for Credit:** Yes, unlimited number of completions

**Learning Outcomes:** 1. Apply concepts learned in coursework to authentic professional situations

Audience: Undergraduate

2. Demonstrate professional skills appropriate for the industry

Audience: Undergraduate

3. Identify and reflect on how concepts learned in coursework apply to specific work settings and situations

Audience: Undergraduate

**AGROECOL 400 – STUDY ABROAD IN AGROECOLOGY**

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Current enrollment in a UW-Madison study abroad program

**Requisites:** None

**Repeatable for Credit:** Yes, unlimited number of completions

**AGROECOL 503 – AGROECOLOGY CAPSTONE**

3 credits.

A stepping stone between the classroom and society. Emphasizes integration of diverse bodies of agroecological knowledge, critical thinking, and engagement with real-world problems and current research. Topics such as: bioproducts, food systems and security, economic vitality of communities, climate change, humans and their environment, biodiversity, resource management and policy, and social equity.

**Requisites:** ENVIR ST/AGROECOL/C&E SOC/ENTOM 103, AGROECOL 303, and senior standing

**Repeatable for Credit:** No

**Learning Outcomes:** 1. Integrate diverse bodies of knowledge to solve an agroecological problem or formulate a policy of society importance  
Audience: Undergraduate

2. Evaluate the strength and value of information, evidence, and approaches relevant to a specific problem or policy  
Audience: Undergraduate

3. Discuss and lead discussions with peers regarding a specific agroecological problem or policy  
Audience: Undergraduate

4. Write and present comprehensive reports regarding a specific agroecological problem or policy for scientists or policymakers  
Audience: Undergraduate

5. Write and present comprehensive reports regarding a specific agroecological problem or policy for the general public  
Audience: Undergraduate

**AGROECOL 699 – SPECIAL PROBLEMS**

1-3 credits.

Scholarship on special topics, under the supervision of an agroecology faculty member.

**Requisites:** Consent of instructor

**Course Designation:** Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Fall 2024

**Learning Outcomes:** 1. Frame an agricultural problem using an agroecological lens  
Audience: Undergraduate

2. Describe multifunctional agricultural solutions  
Audience: Undergraduate

**AGROECOL 701 – THE FARM AS SOCIO-ENVIRONMENTAL ENDEAVOR**

3 credits.

Farms may be analyzed as intentional entities shaped by the contexts in which they must operate. This course explores how these biophysical and social contexts both exert constraints and provide opportunities, leading to the diversity of farms observed.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Develop a vision of agriculture as a social and ecological activity for which we have many diverse demands  
Audience: Graduate

2. Differentiate the roles of the natural and social sciences of agriculture, including their basic methods of inquiry  
Audience: Graduate

3. Apply an agroecological imagination to think about food and agriculture contextually  
Audience: Graduate

4. Reflect on the organizational, political, and personal challenges to cultivating a more beneficent agriculture  
Audience: Graduate

5. Engage with the organizational, political, and personal challenges of this contextualized diversity for the cultivation of a more beneficent agriculture

Audience: Graduate

**AGROECOL 702 – THE MULTIFUNCTIONALITY OF AGRICULTURE**

3 credits.

Agroecology systems provide a variety of social, economic, and ecological functions to society, each with a different network of stakeholders. This course explores methods of evaluating these diverse functions and perspectives, with a special focus on participatory approaches.

**Requisites:** Declared in Agroecology MS

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Collect, analyze, and interpret data on an agroecology-related issue

Audience: Graduate

2. Integrate and apply multiple disciplinary perspectives such as technical, economic, socio-political, and environmental factors in the context of complex agroecology problems

Audience: Graduate

3. Plan and manage a long-term project

Audience: Graduate

4. Communicate effectively with clients and multidisciplinary teams

Audience: Graduate

5. Produce professional-quality deliverables such as presentations and reports

Audience: Graduate

**AGROECOL 710 – SEMINAR IN AGROECOLOGY**

1 credit.

Facilitated discussions on agroecology-related scholarship, policies, and practices. May include presentations on current or proposed research.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Present current or proposed research

Audience: Graduate

2. Facilitate discussion of agroecology-related scholarship

Audience: Graduate

3. Integrate and apply multidisciplinary perspectives to evaluate and propose solutions to agroecology problems

Audience: Graduate

4. Analyze and discuss agroecology research, policies, and practices

Audience: Graduate

5. Evaluate peer presentations

Audience: Graduate

**AGROECOL 720 – AGROECOLOGY FIELD STUDY**

1-3 credits.

Field study of farms, processing, marketing, distribution, and policy-making in the food system. Courses will be several days of visits, discussions with the operators, and student-faculty discussion sections. Presentations or written reports may be required.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2024

**Learning Outcomes:** 1. Interact with practitioners of agroecology, such as farmers, ranchers, field researchers, policy makers, social scientists

Audience: Graduate

2. Describe the scope of agriculture in Wisconsin and relationships among the university and the community

Audience: Graduate

**AGROECOL/ENVIR ST 724 – AGROECOSYSTEMS AND GLOBAL CHANGE**

3 credits.

Impacts of global change drivers (climate change, atmospheric chemistry, bioenergy, urbanization, policy) on agroecosystems and their associated goods and services; environmental impacts of agricultural land use and feedbacks to climate; modeling approaches; critical review of current scientific literature.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Explain key physical, biological, and social drivers of change to agroecosystems on planet Earth

Audience: Graduate

2. Apply important biophysical and biological concepts to describe how a changing climate and changes in atmospheric composition impact agricultural systems

Audience: Graduate

3. Describe how agricultural land management impacts the Earth's climate system through changing biogeochemical cycling

Audience: Graduate

4. Discuss how agricultural land management impacts Earth's climate system through biogeophysical processes that effect energy and water balance in the soil-plant-atmosphere system

Audience: Graduate

5. Identify and summarize ecosystem services that are impacted by agroecosystems and land management decision-making, and how this effects global environmental sustainability

Audience: Graduate

**AGROECOL 799 – PRACTICUM IN AGROECOLOGY TEACHING**

1-3 credits.

Instructional orientation to teaching at the higher education level in Agroecology, direct evidence-based teaching experience under faculty supervision, experience in testing and evaluation of students, and the analysis of teaching performance.

**Requisites:** Consent of instructor

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Learning Outcomes:** 1. Articulate learning goals for the practicum in cooperation with supervising instructor

Audience: Graduate

2. Prepare and/or implement lesson plans for a class period, week, or module of the class

Audience: Graduate

3. Deliver course content and/or facilitate discussion

Audience: Graduate

4. Identify pedagogical strengths and opportunities for growth based on classroom assessment and/or feedback

Audience: Graduate

**AGROECOL/ATM OCN/BOTANY/ENTOM/ENVIR ST/GEOG/  
ZOOLOGY 953 – INTRODUCTION TO ECOLOGY RESEARCH AT  
UW-MADISON**

1-2 credits.

Introduction to diverse ecological research across the UW-Madison Campus. Discussions on adapting to graduate school and graduate-level ecological research, key topics in professional development, and research presentations by faculty members.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

**Learning Outcomes:** 1. Develop an appreciation for the foundations and legacy of ecology research and conservation science at UW-Madison

Audience: Graduate

2. Recognize the diversity and strength of current research in ecology at UW-Madison

Audience: Graduate

3. Differentiate expectations between undergraduate education and those of independent research for graduate degrees in ecology

Audience: Graduate

4. Develop appropriate expectations for advisors and advisees

Audience: Graduate

5. Reason through hypothetical ethical challenges and identify potential solutions based on professional codes of ethics

Audience: Graduate

6. Develop an understanding of the suite of skills associated with success in graduate school and in science

Audience: Graduate

**AGROECOL 990 – RESEARCH**

1-12 credits.

Independent research on the student's thesis or degree project.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Conduct agroecological research including framing with a multifunctional perspective, engaging in co-learning with communities, and communicating with diverse partners

Audience: Graduate