SUSAG 50 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: SUSAG 50 Title: INTRO SUSTAIN AGRI
Full Title: Introduction to Sustainable Agriculture
Last Reviewed: 1/28/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	SUSAG 100

Catalog Description:
Designed to provide an introductory overview of the issue of sustainability in agroecosystems, this course introduces the concepts and principles of agroecology as applied to the design and management of sustainable agricultural systems. Includes an examination of case studies to connect sustainable agriculture principles to actual farming practices. Course includes mandatory field trips to local farms and guest speakers.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Schedule of Classes Information:
Description: Designed to provide an introductory overview of the issue of sustainability in agroecosystems, this course introduces the concepts and principles of agroecology as applied to the design and management of sustainable agricultural systems. Includes an examination of case studies to connect sustainable agriculture principles to actual farming practices. Course includes

mandatory field trips to local farms and guest speakers. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Fall 2005	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 2019	
IGETC:	**Transfer Area**		Effective:	Inactive:

CSU Transfer:	Transferable	Effective:	Fall 2005	Inactive:
UC Transfer:		Effective:		Inactive:

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Compare and contrast the properties of natural ecosystems, sustainable agroecosystems, and conventional agroecosystems.
2. Summarize the ecological roles of plants and their functional relationships to an agroecosystem.
3. Address current issues and identify solutions of sustainability within agroecosystems.

Objectives:
At the conclusion of this course, the student should be able to:
1. Relate the methods of scientific investigation to agricultural productivity.
2. Define the nature of scientific inquiry.
3. Describe the values, themes, methods, and history of sustainable agriculture regionally and worldwide.
4. Define sustainable agriculture.
5. Describe the characteristics of a natural ecosystem.
6. Compare and contrast the properties of natural ecosystems, sustainable agroecosystems, and conventional agroecosystems.
7. Define soil health and evaluate the role of management practices in building soil health in ecological agriculture systems.
8. Discuss the principles and strategies of sustainable agriculture.
9. Optimize the use of water to promote an ecological use of resources.
10. Summarize the ecological roles of plants and their functional relationships to an agroecosystem.

11. Assess an agroecosystem for its level of sustainability based on indicators of a sustainable system.
12. Prescribe ways of converting to a sustainable system through the redesign of a conventional agroecosystem.
13. Discuss the goals and components of a community food system.
14. Identify career opportunities and objectives in sustainable agriculture.

Topics and Scope:

I. What is Sustainable Agriculture?
- A. Problems associated with industrial agriculture/food systems.
- B. Characteristics of sustainable agriculture.
- C. Defining sustainability
- D. Regenerative agriculture
- E. Contrast sustainable and regenerative agriculture systems
- F. Case studies of regenerative farming systems

II. Agroecology and the Agroecosystem Concept
- A. Ecosystem definition
- B. Ecosystem components – biotic and abiotic
- C. Ecosystem processes
- D. Ecological differences between natural systems, industrial agriculture, and sustainable agriculture systems.
- E. Ecosystem services and agriculture

III. Soil Health and Management
- A. Soil health defined
- B. Material composition of healthy soils
- C. Soil structure
- D. Soil food web
- E. USDA soil health principles
- F. Management practices for improving soil health

IV. The Evolution of Agriculture: Domestication and Genetics in Agroecosystems
- A. Historical development and spread of agriculture
- B. Centers of origin for crop and livestock species
- C. Adaptation and natural selection
- D. Plant traits selected by agriculture
- E. Livestock traits selected by agriculture
- F. Importance of Agrobiodiversity
- G. Genetic vulnerability
- H. Distinguish among open pollinated, hybrid, landrace, genetically modified and transgenic crops
- I. Grassroots approaches to preserving agrobiodiversity

V. Water Management in Agriculture
- A. Soil water storage and availability
- B. Soil plant atmosphere continuum
- C. Reducing evaporation in agriculture
- D. Principles of rainwater harvesting
- E. Earthworks and tanks for rainwater harvesting
- F. Calculating potential rainwater catchment on structures

VI. Cropping Systems
- A. Ecological relationships
- B. Understanding ecological relationships among different plant types as a basis for cropping systems

C. Ecological interference
D. Ecological impacts of cover crops
E. Crop rotations
F. Agroforestry systems

VII. Livestock Systems: Animals in Sustainable Agriculture
A. Roles of animals in natural ecosystems
B. Integrated livestock systems
C. Beneficial roles of animals on an integrated farm

VIII. Ecological Pest Management
A. Biodiversity and pest management
B. Biocontrol
C. Economic threshold and pest management
D. Principles of ecological pest management

IX. Alternative Agriculture Approaches
A. Factors that promote conversion to ecological management
B. Principles of ecological management
C. Levels of conversion to ecological management
D. Organic certification
E. Sustainable certification for wine grapes
F. Case studies of ecological conversion.

X. Evaluating Sustainability in Agroecosystems
A. Indicators of sustainability in agriculture
B. Developing an on farm evaluation of agroecosystem sustainability

XI. Food Systems
A. Food system defined
B. Food security
C. Food deserts
D. Community food systems: goals and components
E. Examples of regional food systems

XII. Field Trips to Farms Practicing Regenerative Management in the Local Region

Assignment:

1. Reading (15-30 pages per week)
2. Research project to develop an ecological design for an on-farm project
   A. PowerPoint presentation to class about research topic (12 – 15 minutes)
   B. Outline as first draft of research presentation
   C. Written summary of research topic
3. Lead a class discussion on scientific article or class reading in sustainable agriculture
4. Written evaluation of a local farm's level of sustainability, using the indicators of a sustainable system (3 pages)
5. Written case study on regenerative farming system (3 pages)
6. Written case study on community food systems (3 pages)
7. Prepare annotated bibliography of references for research on ecological farming practices
8. Quizzes, midterm, final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Case study reports, project outline and written summary, annotated bibliography	Writing 20 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Research and design project presentation, sustainability evaluation	Problem solving 20 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Completion, short essay	Exams 30 - 40%

Other: Includes any assessment tools that do not logically fit into the above categories.

Discussion leader, class participation	Other Category 10 - 20%

Representative Textbooks and Materials:
Agroecology: The ecology of sustainable food systems. 3rd ed. Gliessman, Stephen. CRC Press. 2015
Web-based materials and various short readings/essays provided by instructor