SUSAG 50 Course Outline as of Summer 2017

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	10	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 field trips to local farming systems 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

field trips to local farming systems 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

Outcomes and Objectives:
Upon successful completion of this course the student will 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. Evaluate the role of soil fertility in an ecological production system.
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. Identify career opportunities and objectives in sustainable agriculture.

Topics and Scope:

I. Introduction to Agroecology and Sustainable Agriculture

A. What is sustainable agriculture?
B. Terms related to sustainability
C. Common themes of sustainable agriculture
D. The three "E's of sustainability
1. Economic viability
2. Environmental health
3. Equity (social)

II. Concepts of Agroecology and Sustainability
A. Agroecology as a science
1. The nature of scientific inquiry
2. Application of the scientific method to problem solving
3. Ecological imperative for sustainable agriculture
4. Global impacts of sustainable agriculture
B. Ecosystem characteristics
1. Natural ecosystems
2. Sustainable agroecosytems
3. Conventional agroecosystems
C. Ecological Principles
1. Niche
2. Succession
3. Biological diversity
4. Applications of niche theory to agriculture
D. Steps in the ecological design process
1. Observation
2. Visioning
3. Planning
4. Development
5. Implementation
E. Natural patterns in the garden

III. History of Sustainable Agriculture
A. Worldwide
B. United States
1. 1980 - 1990
2. 1990- present
C. Regionally
D. Advent of modern agriculture
E. Modern agriculture in crisis
F.Sustainability issues within conventional agriculture
G. Barriers to Developing Agricultural Sustainability
1. Ecological
2. Social
3. Economic

IV. Key components of Sustainable Agriculture
A. Soil fertility and nutrient cycling
B. Enhancing and maintaining biological diversity
C. Integrated pest management (IPM)
D. Input reduction
E. Water management
F. Conservation of natural resources
G. Ecosystem (agroecosystem) management
H. Benefits of a sustainable agroecosystem
1. Genetic diversity

2. Productivity
3. Resilience
4. Low reliance on external input

V. Achieving Sustainability

A. Learning from existing agroecological systems

1. Biological agriculture
2. Nature farming
3. Organic agriculture
4. Biodynamic agriculture
5. Permaculture

B. Comparing existing agroecological systems

C. Converting to sustainable practices

VI. Specific Strategies

A. Protecting and enhancing soil microbiology and productivity

B. Water management

1. Use of water in agriculture
   a. Principles of irrigation
   b. Optimizing use of the water resource
2. Water conserving techniques
   a. High organic matter content
   b. Deep mulching
   c. Water-conserving plants
   d. Dense planting
   e. Soil contouring

i. swales

ii. contours

   f. Water catchment

i. Harvest and storage of rainwater

ii. Using greywater

C. Enhancing and maintaining biological diversity

1. Uses of plants
   a. Multipurpose plants
   b. Ecological roles of plants
2. Annuals and perennials
   a. Perennial vegetables
   b. Herbs
   c. Greens
3. Roots and tubers
4. Microclimates
5. Plant communities
   a. Interplanting /intercropping
   b. Polyculture
   c. Plant guilds
   b. Habitat strips and hedgerows

D. Incorporating principles of (IPM)

1. Attracting beneficial insects
   a. Predatory insects
   b. Parasitic insects
   c. Pollinators
   d. Weed feeders
2. Attracting birds
   a. Food

b. Water
c. Shelter
d. Protection
e. Habitat diversity

3. Use of other animals
a. Chickens
b. Ducks
c. Rabbits
d. Other livestock species

E. Input reduction (efficient use of inputs)
1. Maximize reliance on natural, renewable and on-farm inputs
2. Not simple input substitution
3. Assess situations where the use of synthetic chemicals would be more "sustainable"
4. Goal: develop efficient, biological systems which do not need high levels of material inputs

F. Conservation of natural resources
1. Wildlife habitat
2. Energy
3. Air

G. Integrating and managing livestock within agroecosystems
1. Animal Husbandry
a. Variety selection and animal reproduction
b. Select appropriate stock for farm or ranch resources
c. Grazing and range management
d. For herd health and productivity
e. For environmental quality
f. For biodiversity conservation
g. Integrating crop and livestock production
h. National Organic Program (NOP) standards

VII. Case Studies
A. National perspective
B. Local case studies

VIII. Career Opportunities in Sustainable Agriculture

XVI. Current issues with sustainability.

Assignment:

Representative assignments may include and may not be limited to:
1. Specific reading and study assignments from texts, handouts, and internet sites (15-30 pages per week).
2. Applications of scientific method that may include:
a. analyze agricultural productivity in conventional vs. sustainable systems and write a 2-3 page report on findings
b. evaluate and compare conventional vs. organic system field trials (based on field trips to conventional and organic farming systems)
3. Conduct interviews with farmers for case studies.
4. Based on case study, prepare a written evaluation of a local farm's level of sustainability, using the indicators of a sustainable system (3-5 pages).
5. Present case study evaluation to class (10-12 minutes).
6. Prepare annotated bibliography of classic readings of Sustainable Agriculture and Agroecology.

7. 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 report, annotated bibliography, analytical report	Writing 20 - 30%

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

Case study evaluation, cropping systems analysis	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.

Case study presentations, class participation	Other Category 10 - 20%

Representative Textbooks and Materials:
Earthscan Reader in Sustainable Agriculture, an Earthscan Readers Series. Obe, Jules Pretty. 2005. Routledge
Ecological Principles in Agriculture. Powers, Laura E. and McSorely, Robert. Delmar, 2000 (classic)
Agroecology: Ecological Processes in Sustainable Agriculture. Gliessman, Stephen R. Sleeping Bear Press, 1998.(classic)
web based materials and various short readings/essays