

Tompkins Cortland Community College

## Master Course Syllabus

**Course Discipline and Number: ENVS 141**

**Year: 2023-2024**

**Course Title: Agroecology**

**Credit Hours: 3**

**Attendance Policy:** *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

**Services for Students with Disabilities:** *It is the College's policy to provide, on an individual basis, reasonable accommodation to students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

### Course Description

Agroecology is defined as the application of ecological principles to the design and management of sustainable farming systems. Through this course, students will move away from a narrow concern with farming practices, and toward a scientific understanding of the complex interactions among crop plants, soil, soil organisms, insects, insect enemies, other biotic and abiotic elements of farming systems, environmental conditions, and agricultural management decisions. Students will also learn to understand and appreciate the effects of farming systems on surrounding ecosystems, the food system, and the planet. Lab fee required. ENVS 141 fulfills the SUNY Natural Sciences requirement. Prerequisite: Prior completion or concurrent enrollment in ENGL 099 if required by placement testing or prior completion or concurrent enrollment in ESL 120, 121, and 122 (or prior completion of ESL 103); prior completion or concurrent enrollment in MATH 090 if required by placement testing; RDNG 099 if required by placement testing. 3 cr. (2 Lec. 2 Lab.). Spring semester.

### Course Context/Audience

ENVS 141 is a required course for students enrolled in the Sustainable Farming & Food Systems A.A.S degree program. It may also be used to fulfill a lab science requirement or an unrestricted elective requirement.

### Basic Skills/Entry Level Expectations

- Writing:** W1 Prior completion or concurrent enrollment in ENGL 099 or prior completion or concurrent enrollment in ESL 103 if required by placement testing. This course requires short written responses and/or short papers.
- Math:** M1 Prior completion or concurrent enrollment in MATH 090 if required by placement testing. Basic Mathematical skills are required.
- Reading:** R2 Before taking this course, students must have a C or better in RDNG 099 or assessment indicating that RDNG 099 was not required.

## Course Goals

Upon successful completion of this course, students will be able to identify core agroecological principles, and understand the ways in which they can be applied to the planning and implementation of sustainable farm production systems.

## Course Objectives/Topics

Objective/Topic	% Course
The student will become familiar with the basic concepts and principles of the science of ecology.	~20%
The student will become familiar with the basic concepts and principles of the science of botany	~10%
The student will gain a critical understanding of the application of ecological principles to sustainable farm production systems.	~70%
Field trips to area farms	0-5%

### *Potential Lecture topics:*

Agroecology and Agroecosystems  
Basic Botany  
The Plant in the Environment  
The Theory and Practice of Crop Rotation  
Biotic Factors in Agroecology  
Heterotrophic Organisms in Agroecosystems  
Species Interactions in Crop Communities  
The Theory and Practice of Cover Cropping  
Genetic Resources in Agroecosystems  
Agroecosystem Diversity  
Disturbance, Succession, and Agroecosystem Management  
Animals in the Agroecosystem  
Energetics of Agroecosystems  
Landscape Diversity  
Converting to Ecologically Based Management  
Sustainability Indicators  
Compost Ecology and Practice  
Permaculture Concepts  
Water and Irrigation in the Agroecosystem  
Tillage and Tillage Equipment in the Agroecosystem

### *Potential laboratory topics:*

Effect of Microclimate on Seed Germination  
Light Transmission and the Vegetative Canopy  
Soil Temperature and Plant Growth  
Canopy Litterfall Analysis  
Mulch System Comparison  
Intraspecific Interactions in a Crop Population  
Management History and the Weed Seedbank  
Comparison of Arthropod Populations  
Census of Soil-Surface Fauna  
Bioassay for Allelopathic Potential  
*Rhizobium* Nodulation in Legumes  
Effects of the Agroecosystem Diversity on Herbivore Activity  
Herbivore Feeding Preferences  
Effects of a Weedy Border on Insect Populations  
Mapping Agroecosystem Diversity  
Overyielding in an Intercrop System  
Comparison of Agroecosystem Diversity Pre/Post Porcine Pasturing  
Effects of Trees in an Agroecosystem  
On Farm Energy Use Audit  
NEW 11-14-16/T.Reid

## General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
<p>Students will be able to</p> <ul style="list-style-type: none"> <li>➤ develop meaningful questions to address problems or issues.</li> <li>➤ gather, interpret, and evaluate relevant sources of information.</li> <li>➤ reach informed conclusions and solutions.</li> <li>➤ consider analytically the viewpoints of self and others.</li> </ul>	<p>This course will use an inquiry based approach to look at the ecological relationships between the various aspects of a sustainable farming system..</p> <p>Students will learn to apply theoretical agroecological principles to practical-hands-on crop and soil management decisions on a sustainable farm.</p> <p>Students learn to perform and evaluate the results of scientific experiments that test the basic principles of agroecology.</p> <p>Students will be asked to evaluate their own personal beliefs and those of others in the context of current knowledge in the field of agroecology, and how these decisions affect the management of a sustainable farming system.</p> <p>These outcomes are addressed through, lectures, readings, discussion, writing exercises, laboratory exercises, farm walks, and field trips.</p>
SOCIAL/GLOBAL AWARENESS OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
<ul style="list-style-type: none"> <li>➤ Students will begin to understand how their lives are shaped by the complex world in which they live.</li> <li>➤ Students will understand that their actions have social, economic and environmental consequences.</li> </ul>	<p>Students will examine the ways in which their lifestyles and farming choices impact the food system and ecological systems around them.</p> <p>The course will examine the social dimension of sustainable farming and focuses on why sustainable solutions must consider social context.</p> <p>The course examines the economic dimension of sustainable farming, and focuses on why sustainable solutions must consider economic feasibility.</p> <p>These outcomes are addressed through lecture, discussion, readings, writing exercises, laboratory exercises, farm walks, and field trips.</p>

### Instructional Methods

Lectures, discussion, readings, writing exercises, laboratory exercises, farm walks, and field trips are all appropriate.

### Methods of Assessment/Evaluation

Method	% Course Grade
Participation	0-10%
Writing Assignments	0-20%
Projects	0-20%
Quizzes and Tests	35-65%
Laboratory Reports	10-30%

**Text(s)**

Gliessman, Stephen R. 2015. Agroecology: The Ecology of Sustainable Food Systems (Third Edition). CRC Press: Boca Raton, London, New York. (ISBN #1439895619)

Gliessman, Stephen R. 2014. Field and Laboratory Investigations in Agroecology (Third Edition). CRC Press: Boca Raton, London, New York. (ISBN #1439895716)

**Bibliography**

Davies, G., and Lennartsson, M., eds. 2006. Organic Vegetable Production: A Complete Guide. Crowood Press. (ISBN 978 1861-2678-87)

**Other Learning Resources****Audiovisual**

No resources specified

**Electronic**

<https://attra.ncat.org/>

<https://nysipm.cornell.edu>

<http://www.agroecology.org/>

**Other**

No resources specified