

Sustainability Infusion Project

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Title of Module/Activity

Infusing Sustainability Concepts throughout a Plant and Landscape Systems Course

Course Name and Course Number

Plants, Landscapes, and the Environment (AGRO/HORT/TLMT 100)

Length of Module/Activity

This is a 3-credit course that meets two times per week (75 minutes) for 15 weeks. The course is divided into six units, which are each 2-3 weeks long. There are six sustainability modules and classroom assessments described here that would pair with the six units of the course. Each module and assessment are approximately equal to one day of class (75 minutes or 0.5 week), and in aggregate these modules will require 3 weeks of the semester.

Modules

#1: Introduction to Systems Thinking and Sustainability

Primary Learning Outcome

Students will be able to create and evaluate the accuracy of diagrams for describing complex systems.

Key Sustainability Competencies Addressed

Normative and systems thinking competency

Instructional Strategies

Lecture, learning check-ins, and exam

Assessment Strategy

- *Formative assessment:* Watch video and map concepts using principles of systems diagrams
- *Summative assessments:* Exam

#2: Sustainability tradeoffs of nitrogen management in vegetable systems

Primary Learning Outcomes

1) Students will be able to analyze and interpret nutrient use efficiency data in a vegetable crop system; and 2) students will be able to recommend strategies for balancing economic and environmental tradeoffs of nutrient management in a vegetable production system.

Key Sustainability Competencies Addressed

Normative and systems thinking competency

Instructional Strategies

Lecture, learning check-ins, project, and exam

Assessment Strategy

- *Formative assessment:* Lecture and learning check-in about nitrogen loss
- *Summative assessments:* Sustainable Lettuce Competition where students make decisions about how to manage a lettuce crop for optimum productivity, profitability, and input-use-efficiency (i.e., sustainability)

#3: Assess the sustainability of different greenhouse media

Primary Learning Outcomes

Students will be able to use a decision-support matrix to organize science-based evidence, make systematic comparisons of possible solutions, and make sustainability recommendations based on this evidence.

Key Sustainability Competencies Addressed

Action-oriented competency

Instructional Strategies

Lecture, learning check-ins, project, and exam

Assessment Strategy

- *Formative assessment:* Lecture and learning check-in
- *Summative assessments:* Decision-support matrix to compare solutions and make recommendations for action

#4: Conservation agriculture for ecosystem services

Primary Learning Outcomes

Students will be able to explain the benefits of conservation agricultural practices and use data to justify tradeoffs between agricultural productivity and environmental stewardship.

Key Sustainability Competencies Addressed

Normative competency

Instructional Strategies

Lecture, learning check-ins, project, and exam

Assessment Strategy

- *Formative assessment:* Lecture and learning check-ins
- *Summative assessments:* PEWI Watershed Game to make decisions about a watershed and quantify changes in ecosystem outcomes

#5: Sustainability of local/urban versus global food systems

Primary Learning Outcomes

1) Students will be able to list social, economic, and environmental benefits and challenges of urban and global food systems; and 2) students will be able to interpret food marketing information at grocery stores and use it to make recommendations for a sustainable diet.

Key Sustainability Competencies Addressed

Normative competency

Instructional Strategies

Lecture, learning check-ins, project, and exam

Assessment Strategy

- *Formative assessment:* Lecture and learning check-ins
- *Summative assessments:* Grocery store investigation where students explore origins of food

#6: Effects of landscape plant selection on biodiversity

Primary Learning Outcomes

Students will be able to identify characteristics of plants necessary to achieve cultural, ecological, and production functions in the designed urban landscape.

Key Sustainability Competencies Addressed

Normative competency

Instructional Strategies

Lecture, learning check-ins, project, and exam

Assessment Strategy

- *Formative assessment:* Lecture and learning-check-ins
- *Summative assessments:* Students virtually explore a garden and make plant selection choices