



AGS 20 - Plant Science

Catalog Description

Transfer Status: CSU/UC

Unit(s): 3.00

Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

Total: 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: This course is an introduction to plant science including structure, growth processes, propagation, physiology, growth media, biological competitors, and post-harvest factors of food, fiber, and ornamental plants. (C-ID AG-PS 104).

Objectives

Upon successful completion of this course, the student should be able to:

1. Categorize the roles of higher plants in the living world.
2. Describe the structural components of higher plants.
3. Explain the standard plant propagation methods.
4. Describe sexual and asexual reproduction in higher plants.
5. Explain photosynthesis, respiration, transpiration, and translocation in higher plants.
6. Describe the physical and chemical properties of soils.
7. Hypothesize solutions for soil erosion problems.
8. Describe the climatic influences on plant growth and development.
9. Categorize the biological competitors of higher plants.
10. Describe the scientific method and explain its application in solving problems in plant and soil science.

Course Content

Topic Titles / Suggested Time Topic	
	<u>Lecture</u>
<u>Topics</u>	<u>Lec Hrs</u>
The role of higher plants in the living world	2.00
a. Fossil fuels	
b. Food web	
c. Industrial products	
d. Ancient plant life	
e. Terrestrial ecosystems and global cycles	
Structure of higher plants	4.00
a. The life cycle of a plant	
b. The cell	
c. Cell structure	
d. The plant body	
Naming and classifying plants	1.00
a. Climate	
b. Botanical names	
c. Botanical classifications	
d. Plant taxonomy	
Origin, domestication, and improvement of cultivated plants	2.00
a. Origin of cultivated plants	
b. Domestication of plants	
c. Crop plants	
d. Germplasm	
e. Genetic concepts in plant improvement	
Propagation of plants	2.00
a. Propagation methods	
b. Sexual propagation	
c. Vegetative propagation	
Vegetative and reproductive growth and development	3.00
a. Vegetative growth and development	

<u>Topics</u>	<u>Lec Hrs</u>
b. Reproductive growth and development	
c. Plant growth regulators	
Photosynthesis, respiration, and translocation	8.00
a. Photosynthesis	
b. Plant respiration	
c. Electron transport system	
d. Assimilation	
Soil and soil water	2.00
a. Factors involved in soil formation	
b. Physical properties of soil	
c. Chemical properties of soil	
d. Soil organisms	
e. Soil organic matter	
f. Soil water	
g. Water quality	
Soil and water management and mineral nutrition	2.00
a. Land preparation	
b. Irrigation	
c. Mineral nutrition	
d. Soil conservation	
Climatic influences on crop production	2.00
a. Climatic factors affecting plant growth	
b. Climatic requirements of some crop plants	
c. Weather and climate	
d. Climatic influences on plant diseases and pests	
Biological competitors of useful plants	2.00
a. Weeds	
b. Plant diseases	
c. Plant pests	
d. Nematodes	
e. Rodents	
f. Pesticide impacts on the environment	
The scientific method	2.00
a. Developing a hypothesis	
b. Scientific design	
c. Application to plant/soil problems	
Crops/harvest practices	2.00
a. Crops grown in region	
b. Harvest practices	
c. Post-harvest practices	
Total Hours: 34.00	

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Structure of higher plants	6.00
Naming and classifying plants	3.00
Propagation of plants	6.00
Vegetative and reproductive growth	6.00
Soil and soil water	6.00
Fertilizers and plant nutrient needs	3.00
Biological competitors of useful plants	3.00
Application of the scientific method	6.00
Appropriate technology skills used in Plant Science	6.00
Harvest/post-harvest practices	6.00
Total Hours: 51.00	

Methods of Instruction

- A. Class Activities
- B. Discussion

- C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- D. Laboratory Experiments
- E. Lecture

Methods of Evaluation

- A. Exams/Tests
- B. Research Projects
- C. Class participation
- D. Lab Projects
- E. Written Assignments

Examples of Assignments

Reading Assignments

1. Read the chapter on flower and fruit formation in your text. Be prepared to discuss a particular fruit type in class.
2. Read an article from a plant journal about the scientific method. Be prepared to discuss the parts of the journal article in class.

Writing Assignments

1. Write a 3-4 page lab report on tissue culture.
2. Write a 2-3 page paper on the importance of genetics to the selection process of plants.

Out-of-Class Assignments

1. Observe a local agricultural crop and describe the production methods in use in a 1-2 page paper.
2. Watch a documentary about crop production and summarize in a 1-2 page paper.

Recommended Materials of Instruction

McMahon, M.E. (2019). Hartmann's Plant Science: Growth, Development, and Utilization of Cultivated Plants. *Pearson*, 4th. 9780135184820.

Bidlack, J. & Jansky, S. (2025). Stern's Introductory Plant Biology. *McGraw Hill*, 15th. 9781260488623.

Zero Cost Textbook

Michaels T., et al. (2022). The Science of Plants. University of Minnesota Libraries Publishing. (OER).
<https://open.umn.edu/opentextbooks/textbooks/1196>

Ha, M., et al. (2022). Botany. ASCCC Open Educational Resources Initiative. (OER).
[https://bio.libretexts.org/Bookshelves/Botany/Botany_\(Ha_Morrow_and_Algiers\)](https://bio.libretexts.org/Bookshelves/Botany/Botany_(Ha_Morrow_and_Algiers))

Minimum Qualifications

Agricultural Production
Agriculture (Masters Required)
Biological Sciences (Masters Required)

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