

# HARTNELL COLLEGE COURSE OUTLINE

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## DESIGNATOR & NUMBER



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, and translocation in higher plants.
6. compare the life cycles of annual and biennial plants.
7. compare and contrast the distinguishing characteristics of two commercially important plant families.
8. describe how climate influences 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 science.

## COURSE CONTENT

- I. The role of higher plants in the living world
  - A.

- D. Soil organisms
- E. Soil organic matter
- F. Soil water
- G. Water quality
- IX. Soil and water management and mineral nutrition
  - A. Land preparation
  - B. Irrigation
  - C. Mineral nutrition
  - D. Soil conservation
- X. Climatic influences on crop production
  - 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
- XI. Biological competitors of useful plants
  - A. Weeds
  - B. Plant diseases
  - C. Plant pests
  - D. Nematodes
  - E. Rodents
  - F. Pesticide impacts on the environment

## LAB CONTENT:

- I. Scientific Method
  - A. Steps of the scientific method
  - B. Inductive vs deductive reasoning
- II. The Microscope
  - A. Proper use and care
  - B. Depth of field
  - C. Field of use
- III. The Cell
  - A. Basic plant cell anatomy
  - B. Microscopic visualization of plant cells
- IV. Plant Tissues
  - A. Cambium
  - B. Epidermis
  - C. Xylem and Phloem
- V. Gross plant anatomy
  - A. Roots
  - B. Stems
  - C. Leaves
- VI. Reproduction
  - A. Sexual and asexual reproduction
  - B. Alternation of generations
- VII. Plant Propagation and Lifecycles
  - A. Seed propagation
  - B. Grafting
  - C. Budding
  - D. Layering
- VIII. The Cell Cycle
  - A. Mitosis
  - B. Meiosis

- C. Cytokinesis
- IX. Genetics
  - A. Replication
  - B. Transcription
  - C. Translation
- X. Plant Hormones
  - A. Growth Regulators
  - B. Tropisms and Rapid Movements
- XI. Photosynthesis and Plant Pigments
  - A. Chromatography
  - B. Chlorophyll
  - C. Other pigments
- XII. Bacteria and Fungi
  - A. Microscopic analysis
  - B. Beneficial vs pathogenic
- XIII. Non-Flowering Plants and Photosynthetic Protists
  - A. Algae
  - B. Lichens
  - C. Bryophytes
  - D. Ferns and "Fern Allies"
  - E. Gymnosperms
- XIV. Flowering Plants
  - A. Diversity
  - B. Monocots vs dicots
- XV. Important Crop Families
  - A. Central Coast vegetable crops
  - B. Berries
  - C. Grapes

#### INSTRUCTIONAL METHODOLOGY:

Lecture

Lab Activity

Individual Assistance

Audiovisual (including PowerPoint or other multimedia)

Demonstration

Discussion

Group Activity

Requires a minimum of three (3) hours of work per unit including class time and homework.

#### METHODS OF EVALUATING OBJECTIVES OR OUTCOMES

Methods of evaluation to determine if students have met objectives may include, but are not limited to the following:

CLASSROOM

EXPLANATION

Class Activity

Students prepare for and participate in class activity.

Lab Activity

Students complete weekly lab activity, make plant and insect collections, and answer related questions.

Written Assignments

Completion of lab. questions and text assignments.

EXAMS	EXPLANATION
Skill Demonstration	Demonstrate identification of common plant families and insect orders.
Objective Test	Objective and short answer midterms

**MINIMUM STUDENT MATERIALS:**

Textbook(s) similar to:

McMahon, Margaret J., Kofranek and Rubatsky. Plant Science: Growth, Development, and Utilization of Cultivated Plants 5th Ed, Prentice Hall, 2010  
Stern, Kingsley. Stern's Introductory Plant Biology 10th Ed, McGraw-Hill, 2013  
Tschunko, Almut. Plant Biology Laboratory Manual Pearson, Benjamin Cummings, 07-28-