

# BUTTE COLLEGE

## COURSE OUTLINE

### I. CATALOG DESCRIPTION

**AGS 20 - Plant Science**

**3 Unit(s)**

**Prerequisite(s):** NONE

**Recommended Prep:** Reading Level IV; English Level IV; Math Level III

**Transfer Status:** CSU/UC

34 hours Lecture

51 hours Lab

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).

### II. OBJECTIVES

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

- A. Identify and discuss scientific methods and scientific research.
- B. Categorize the roles of higher plants in the living world.
- C. Describe the structural components of higher plants.
- D. Explain the standard plant propagation methods.
- E. Describe sexual and asexual reproduction in higher plants.
- F. Explain photosynthesis, respiration, and translocation in higher plants.
- G. Describe the physical and chemical properties of soils and how they affect soil erosion problems.
- H. Describe the climatic influences on plant growth and development.
- I. Categorize the biological competitors of higher plants.

### III. COURSE CONTENT

#### **A. Unit Titles/Suggested Time Schedule**

Lecture	
<u>Topics</u>	<u>Hours</u>
1. The role of higher plants in the living world	2.00
A. Fossil fuels	
B. Food chains	
C. Industrial products	
D. Lower forms of plant life	
2. Structure of higher plants	4.00
A. The life cycle of a plant	
B. The cell	
C. Cell structure	
D. The plant body	
3. Naming and classifying plants	1.00
A. Climate	
B. Botanical names	
C. Botanical classifications	
D. Plant taxonomy	

4.	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	
5.	Propagation of plants	2.00
	A. Propagation methods	
	B. Sexual propagation	
	C. Vegetative propagation	
6.	Vegetative and reproductive growth and development	3.00
	A. Vegetative growth and development	
	B. Reproductive growth and development	
	C. Plant growth regulators	
7.	Photosynthesis, respiration, and translocation	8.00
	A. Photosynthesis	
	B. Plant respiration	
	C. Electron transport system	
	D. Assimilation	
8.	Soil and soil water	3.00
	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	
9.	Soil and water management and mineral nutrition	3.00
	A. Land preparation	
	B. Irrigation	
	C. Mineral nutrition	
	D. Soil conservation	
10.	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	
11.	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	
12.	The scientific method	2.00
	A. Developing a hypothesis	
	B. Scientific design	
	C. Application to plant/soil problems	
Total Hours		34.00

## Lab

<u>Topics</u>	<u>Hours</u>
1. Structure of higher plants	6.00
2. Naming and classifying plants	3.00
3. Propagation of plants	6.00
4. Vegetative and reproductive growth	6.00
5. Soil and soil water	6.00
6. Fertilizers and plant nutrient needs	3.00
7. Biological competitors of useful plants	3.00
8. Application of the scientific method	6.00
9. Appropriate technology skills used in Plant Science	6.00
10. Genetics and Plant Reproduction	6.00
Total Hours	51.00

#### IV. METHODS OF INSTRUCTION

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

#### V. METHODS OF EVALUATION

- A. Quizzes
- B. Class participation
- C. Written Assignments
- D. Mid-term and final examinations
- E. Written Reports: Course grade is based on demonstrated proficiency in subject matter and the ability to demonstrate that proficiency by means of a 1500-word lab report.

#### VI. EXAMPLES OF ASSIGNMENTS

- A. 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.
- B. Writing Assignments
  - 1. Write a 3-4 page lab report on tissue culture.
  - 2. Write a short paper (2-3 pages) on the importance of genetics to the selection process of plants.
- C. Out-of-Class Assignments
  - 1. Observe a local agricultural crop and describe in a short paper the production methods in use.
  - 2. Visit the horticulture department greenhouses observing the wide variety of plants and describe in a short paper your personal experience.

#### VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. McMahon, M.E . Hartmann's Plant Science: Growth, Development, and Utilization of Cultivated Plants. 4th Edition. Prentice Hall, 2010.

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