

**AGRI 20 Course Outline as of Fall 2015****CATALOG INFORMATION**

Dept and Nbr: AGRI 20 Title: INTRO TO PLANT SCIENCE

Full Title: Introduction to Plant Science

Last Reviewed: 4/11/2022

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	17.5	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: AG 51

**Catalog Description:**

An introductory course in plant ecology, the fundamentals of botany and the taxonomy of plants with emphasis on plant structure and function. The principles and practices of horticultural crop production as they relate to plant, soil and climatic relationships will be stressed.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 1A or equivalent

**Limits on Enrollment:****Schedule of Classes Information:**

Description: An introductory course in plant ecology, the fundamentals of botany and the taxonomy of plants with emphasis on plant structure and function. The principles and practices of horticultural crop production as they relate to plant, soil and climatic relationships will be stressed. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	C	Natural Sciences	Fall 1981	
<b>CSU GE:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B2	Life Science	Fall 1981	
	B3	Laboratory Activity		
<b>IGETC:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	5B	Biological Sciences	Fall 2019	
	5C	Fulfills Lab Requirement		
<b>CSU Transfer:</b>	Transferable		<b>Effective:</b> Fall 1981	<b>Inactive:</b>
<b>UC Transfer:</b>	Transferable		<b>Effective:</b> Fall 1981	<b>Inactive:</b>

### **CID:**

CID Descriptor:AG - PS 106L Introduction to Plant Science (with Laboratory)

SRJC Equivalent Course(s): AGR120

### **Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Outcomes and Objectives:**

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

1. Discuss the significance of plants to humans and animals.
2. Describe the non-food uses of plants by humans.
3. List examples of the primary food crops: cereals, roots and tubers, sugars, oils, fruits and vegetables.
4. Identify major crops grown in the USA, California and Sonoma County.
5. Describe the economic value of agriculture and horticulture.
6. List the levels of classification within the plant kingdom.
7. Apply the rules of botanical nomenclature to identify various crop plants.
8. Describe the characteristics of gymnosperms and angiosperms, monocots and dicots.
9. Identify and describe the components of the plant cell.
10. Describe the principle plant tissues and their functions (meristematic, fundamental).
11. Describe the morphology and function of roots, stems, leaves, flowers, and modified structures.
12. Compare the processes of photosynthesis and respiration and their role in the carbon cycle.
13. Compare and contrast the cell divisions in plant growth and development.
14. Compare and contrast the different plant growth regulators.
15. Apply Mendelian genetic principles to predict inherited traits in F1 hybrid crosses and F2 generations.
16. Discuss the significance of genetically modified crops in agriculture.
17. Dissect, identify and describe the morphology and function of monocot and dicot seeds, seedlings and plants.

18. Propagate plants by sexual and asexual methods.
19. Describe production cycles for cool season and warm season crops.
20. Describe the effects of climate and environmental factors (light, moisture, temperature).
21. Analyze soil physical properties that influence plant growth (fertility, water holding capacity, aeration) and chemical.
22. Describe the relationship of tillage systems and cover cropping to crop production.
23. Use library and internet resources to research economic, production and marketing data for a selected crop.

## **Topics and Scope:**

### **I. Agriculture and Humanity**

- A. Significance of plants to humans and animals
- B. Early agricultural activity
- C. Nonfood uses of plants

### **II. Crop Distribution**

- A. General crop pattern of the USA
- B. Influence of environment in determining where crops will grow profitably in the US
- C. General crop pattern of California and Sonoma County
- D. Economic value of agriculture and Horticulture in California and Sonoma County
- E. Regulatory agencies: United States Department of Agriculture (USDA), California Department of Food and Agriculture (CDFA), and County Agriculture Commissioner

### **III. Crop Morphology and Physiology**

- A. Structure and function of the plant cell
- B. Simple and complex tissues
- C. Root, stem, leaf and flower
- D. Conductive tissues and translocation (osmosis, diffusion, transpiration)
- E. Basic physiology of plant growth and food manufacture (photosynthesis and respiration)
- F. Classification of fruits

### **IV. Crop production, Tillage, and Cover cropping**

- A. Crop rotation in weed, disease and insect control
- B. Value and limitations of cover crops
- C. Local crop production practices
- D. Tillage systems and effects on soil quality

### **V. Major Weed Pests and Control Methods**

- A. Weed classification
- B. Biological, mechanical and non-chemical control methods
- C. Herbicide types and terminology

### **VI. Seed (sexual) Propagation**

- A. Morphology of monocot and dicot seeds
- B. Factors affecting seed germination
- C. Seed Certification and label

### **VII. Vegetative (asexual) Propagation**

- A. Characteristics of asexual propagation
- B. Methods: cuttings, layering, budding, grafting
- C. Micropropagation (tissue culture)

### **VIII. Crop Improvement and Plant Breeding**

- A. Concepts and terminology
- B. Objectives and methods of crop improvement
- C. Mendelian genetic principles
- D. Impact of genetically modified crops

### **IX. Soil Environment of Plants**

- A. Physical, biological and chemical characteristics of soil
- B. Improving soil conditions for plant growth
- C. Soil conservation practices
- X. Fertilizers and Soil Fertility
  - A. Factors affecting fertilizer use and selection
  - B. Common terms in fertilizer industry
  - C. Elements required by plants and their effect on plant growth
  - D. Fertilizer label
- XI. Climate Effects on Crop Production
  - A. Influence of temperature, soil moisture, light intensity
  - B. Accumulation of heat units
  - C. Adaptation of crops to regions within California
  - D. Effects of latitude and altitude
  - E. Cardinal growth temperatures for representative crops
  - F. Frost protection
- XII. Sustainable and Organic Crop Production
  - A. Comparisons with conventional production
  - B. Certification regulations
  - C. Consumer trends

**Assignment:**

1. Plant collection of crop and weed plants.
2. Crop report (6 to 8 pages) on production of selected crop.
3. Lab activities.
4. Lab write-ups: drawing and labeling plant specimens, describing the morphology and function of dissections of seeds.
5. Reading, 20-30 pages per week.
6. Quizzes, midterm and final exam.

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab reports, crop report	Writing 10 - 50%
<b>Problem Solving:</b> Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.	
Lab activities and plant collection.	Problem solving 10 - 50%
<b>Skill Demonstrations:</b> All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
None	Skill Demonstrations 0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, midterm, final exam: Multiple choice, True/false, Matching items, Completion, essay, short answers

Exams  
30 - 60%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

Plant Science: Growth, Development, and Utilization of Cultivated Plants, 5th edition.  
McMahon, Kofranek, Rubatzky. Prentice Hall, 2011