**AGRI 20 Course Outline as of Fall 2004**

# 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

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| 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, fundamental botany and taxonomy 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:**

**Limits on Enrollment:**

**Schedule of Classes Information:**
Description: Introduction to plant biology, fundamental botany and taxonomy with emphasis on plant structure and function. Principles and practices of horticultural crop production related to soil, plant, and climate. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended:
Limits on Enrollment:

Transfer Credit: CSU;UC. (CAN AG8)
Repeatability: Two Repeats if Grade was D, F, NC, or NP

## ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

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|---|---|---|---|---|
| **AS Degree:** | **Area** | | Effective: | Inactive: |
| | C | Natural Sciences | Fall 2025 | |
| | L5 | Physical and Biological Sciences | | |
| | C | Natural Sciences | Fall 1981 | Fall 2025 |
| **CSU GE:** | **Transfer Area** | | Effective: | Inactive: |
| | B2 | Life Science | Fall 1981 | |
| | B3 | Laboratory Activity | | |
| **IGETC:** | **Transfer Area** | | Effective: | Inactive: |
| | 5B | Biological Sciences | Fall 2019 | |
| | 5C | Fulfills Lab Requirement | | |

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| **CSU Transfer:** | Transferable | Effective: | Fall 1981 | Inactive: |
| **UC Transfer:** | Transferable | Effective: | Fall 1981 | Inactive: |

**CID:**
CID Descriptor: AG - PS 106L Introduction to Plant Science (with Laboratory)
SRJC Equivalent Course(s): AGRI20

**Certificate/Major Applicable:**
Certificate Applicable Course

## 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.
List examples of the primary food crops: cereals, roots and tubers, sugars, oils, fruits and vegetables.
3. Identify major crops grown in the USA, California and Sonoma County.
4. Describe the economic value of agriculture and horticulture.
5. List the levels of classification within the plant kingdom.
6. Apply the rules of botanical nomenclature to identify various crop plants.
7. Describe the characteristics of gymnosperms and angiosperms, monocots and dicots.
9. Identify and describe the components of the plant cell.
10. Describe the principle simple plant tissues.
11. Contrast the functions of xylem and phloem tissues.
12. Describe the morphology and function of roots, stems, leaves and flowers.
13. Compare the processes of photosynthesis and respiration and their role in the carbon cycle.
14. Sow seeds and provide the conditions necessary for seed germination.

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 vegetative (asexual) methods.
19. Prune fruit trees and vines for optimum fruit production.
20. Describe production cycles for cool season and warm season crops.
21. Describe the effects of climate and weather on crops.
22. Analyze soil physical properties that influence plant growth.
23. Compare the properties of common soil amendments and fertilizers.
24. Compare conventional and sustainable methods of crop production, including weed and pest control practices.
25. Describe the relationship of tillage systems and cover cropping to crop production.
26. 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: USDA, CDFA, 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
- E. Basic physiology of plant growth and food manufacture
- 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. Term paper 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.

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| Lab reports, Term papers | Writing<br>10 - 50% |

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

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| Field work | Problem solving<br>10 - 50% |

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

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| None | Skill Demonstrations<br>0 - 0% |

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

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| Multiple choice, True/false, Matching items, Completion, ESSAY, SHORT ANSWERS | Exams<br>5 - 60% |

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

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| None | Other Category<br>0 - 0% |

**Representative Textbooks and Materials:**
Plant Science: Growth, Development, and Utilization of Cultivated Plants, 3rd edition. McMahon, Kofranek, Rubatzky. Prentice Hall, 2002.