

Plant and Soil Science

COURSE OUTLINE

1. Course Title: Plant and Soil Science

2. CBEDS Title: Crop and Soil Science

3. CBEDS Number: 4010

4. Job Titles:

Nursery & Turf Operator
Salesman,
Gardener
Landscape
Gardening Business

Nursery Worker
Plant Propagator
Golf Course Maintenance
Grounds Worker
Garden Store Sales

5. Course Description:

This course is designed for students to study the structure of plants, growth processes, propagation, physiology, plant classification, reproduction, growth media, soil, pests, and cultural harvest practices. The students in the class will operate and run the school greenhouse and conduct plant sales incorporating all of their projects from the year. This course is intended to successfully prepare students who want to pursue a career in the area of agriculture and/or plan on majoring in agriculture sciences at a four year college.

Student Outcomes and Objectives:

Students will:

1. Categorize the roles of higher plants in the living world.
2. Describe the structural components of higher plants.
3. Recognizes the standard plant propagation methods.
4. Describe sexual and asexual reproduction in higher plants.
5. Explain photosynthesis, respiration, 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. Develop theories for the harvest, preservation, transportation, storage, and marketing of an economic plant.
11. Incorporate scientific methods and biological principles with modern Plant and Soil Science practices.
12. Be familiar with cell theory and its application to the organization of all plan organisms.
13. Recognize plant physiology, growth requirements, and nutrients needed for optimum plant growth.

Integrated throughout the course are career preparation standards, which include basic academic skills, communication, interpersonal skills, problem solving, workplace safety, technology, and employment literacy.

Pathway	
Recommended Sequence	Courses
Introductory	Agriculture Science Basic Core
Skill Building	Floriculture or Ornamental Horticulture or Plant and Soil Science
Advanced Skill	Viticulture or Supervised Agricultural Experience Project

6. Hours: *Students receive up to 180 hours of classroom instruction.*

7. Prerequisites: None

8. Date (of creation/revision): July 2011

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Upon successful completion of this course, students will be able to demonstrate the following skills necessary for entry-level employment.				
Instructional Units and Competencies	Course Hours	Model Curr. Standards	CA Academic Content Standards	CAHSEE
<p>I. CAREER PREPARATION</p> <p>A. Career Planning and Management.</p> <ol style="list-style-type: none"> 1. Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers. <ol style="list-style-type: none"> a. Students will identify skills needed for job success b. Students will identify the education and experience required for moving along a career ladder. 2. Understand the scope of career opportunities and know the requirements for education, training, and licensure. <ol style="list-style-type: none"> a. Students will describe how to find a job. b. Students will select two jobs in the field and map out a timeline for completing education and/or licensing requirements. 3. Know the main strategies for self-promotion in the hiring process, such as completing job applications, resume writing, interviewing skills, and preparing a portfolio. <ol style="list-style-type: none"> a. Students will write and use word processing software to create a resume, cover letters, thank you letters, and job applications. b. Students will participate in mock job interviews. 4. <i>Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options.</i> <ol style="list-style-type: none"> a. <i>Students will conduct a self—assessment and explain how professional qualifications affect career choices.</i> 5. <i>Understand the role and function of professional organizations, industry associations, and organized labor in a productive society.</i> <ol style="list-style-type: none"> a. <i>Contact two professional organization and identify the steps to become a member.</i> 6. <i>Understand the past, present and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning.</i> <ol style="list-style-type: none"> a. <i>Students will describe careers in the agriculture industry sector.</i> b. <i>Students will identify work-related cultural differences to prepare for a global workplace.</i> <p>B. Technology.</p> <ol style="list-style-type: none"> 1. Understand past, present and future technological advances as they relate to a chosen pathway and on selected segments of the economy. 2. Understand the use of technological resources to gain access to, manipulate, and produce information, products and services. 3. Use appropriate technology in the chosen career pathway. <p>C. Problem solving and Critical Thinking.</p> <ol style="list-style-type: none"> 1. Understand the systematic problem-solving models that incorporate input, process, outcome and feedback components, and apply appropriate problem-solving strategies and critical thinking to work-related issues and tasks. 2. Use and apply critical thinking and decision making skills 	<p>10</p> <p>Additional hours are integrated throughout the course.</p>	<p>Transportation Industry Sector, Model Curriculum Standards</p> <p>3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0</p>	<p><u>Language Arts</u> (8) R 1.3, 2.6 W1.3, 2.5. LC 1.4,1.5, 1.6 LS1.2, 1.3, 1.4 (9/10) R2.1,2.3,2.6 W2.5 LC1.4 LS 1.1, 2.3 (11/12) R2.3 W2.5 LC1.2 <u>Math</u> (7) NS1.2, 1.3, 1.7 MR 1.1,1.3,2.7,2.8, 3.1</p>	<p>Lang. Arts R 8.2.1</p> <p>(9/10) R 2.1, 2.3 W2.5</p> <p>Math (7) NS 1.2, 1.3, 1.7 MR 1.1, 2.1, 3.1</p>

<p>to make informed decisions, solve problems, and achieve balance in the multiple roles of personal, home, work and community life.</p> <p>D. Health and Safety.</p> <ol style="list-style-type: none"> 1. Know policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities. 2. Understand critical elements of health and safety practices related to a variety of business environments. <p>E. Responsibility & Flexibility.</p> <ol style="list-style-type: none"> 1. Understand the qualities and behaviors that constitute a positive and professional work demeanor. 2. Understand the importance of accountability and responsibility in fulfilling personal, community, and workplace roles and how individual actions can affect the larger community. 3. Understand the need to adapt to varied roles and responsibilities. <p>F. Ethics and Legal Responsibilities</p> <ol style="list-style-type: none"> 1. Know the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations. 2. Understand the concept and application of ethical and legal behavior consistent with workplace standards. <ol style="list-style-type: none"> a. <i>Contact a business and obtain a copy of their rules for employment.</i> b. <i>Role play difference ethical scenarios.</i> 3. Understand the role of personal integrity and ethical behavior in the workplace. <p>G. Leadership and Teamwork.</p> <ol style="list-style-type: none"> 1. Understand the characteristics and benefits of teamwork, leadership, citizenship in the school, community, and workplace settings for effective performance and attainment of goals. 2. Understand the ways in which professional associations, such as FFA, and competitive career development activities enhance academic skills, career choices, and contribute to promote employability. 3. Know multiple approaches to personal conflict resolution and understand how to interact with others in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others. 				
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Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
1. Course Overview a. Course Handouts b. Student/Teacher Responsibilities c. Student Notebooks d. Safety Agreement e. Student/Parent/Teacher Agreement	3		M13.0 G8.0, 11.0, 12.0 Sci. (1.a, c, d, j)	WA1.1, 1.2 R2.1 WS1.1, 1.2, 1.4, 1.9
2. California Agriculture a. Commodities b. Imports and Exports c. Trends and Outlook d. Statistics	5	Ag & Nat. Resources Ind. Sector Agri.Bus. PW A9.0, A9.1	SS 12.2 RC (2.1, .2) W (1.1, .2 .3, 2.3, 2.5)	NS1.2, 1.3, 1.6 MR1.1, 2.1 2.3, 3.3
3. Future Farmers of America (FFA) a. Mission and Creed b. Degrees c. Leadership Opportunities d. Record Keeping e. S.A.E.	2	Ag & Nat. Resources Ind. Sector Foundation Standards 9.0, 9.2, 9.3	EL (1.1, .2)	
4. Plant Structures and Functions a. Roots b. Stems c. Flowers d. Leaves	20	Plant & Soil Sci. PW G3.0, 3.1, 3.2		
5. Soil Science a. Soil Components and Formation b. Weathering and Erosion c. Soil Nutrients d. Soil Amendments	20	Plant & Soil Sci. PW G3.4 G6.0, 6.1		
6. Fertilizers and Plant Nutrition a. Analysis of Fertilizers b. Plant Nutrition c. Deficiencies and Symptoms d. Application Methods	20	Plant & Soil Sci. PW G10.0, G10.1		
7. Plant Reproduction a. Asexual and Sexual Reproduction b. Propagation Methods	20	Plant & Soil Sci. PW G4.0, 4.1, 4.2		
8. Plant, Seed, Crop Identification a. Identify Crops Harvested in California b. Seed Identification c. Vegetable Crops Contest	20	Ag. Sci. PW C1.0, 1.4		
9. Irrigation a. Raised Beds and Planter Boxes b. Drop Irrigation c. Vineyards	20	Plant & Soil Sci. PW G7.0, 7.1		

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
10. Water and Erosion a. Erosion Control b. Water Runoff	20	Plant & Soil Sci. PW G8.0, 8.4		
11. Plant Pathogens and Pests a. Identification b. Control c. Beneficial Insects d. Organic Farming e. Biodynamic Farming	20	Plant & Soil Sci. PW G5.0, 5.1, 5.3, 5.4		

10. Additional recommended/optional items

- a. Articulation: None
- b. Academic credit: College approved elective for college admissions (UC-“G” approved)
- c. Instructional strategies:
 - Methods of Instruction:
 - a. Lecture
 - b. Audio Visual Materials
 - c. Research Readings and Written Presentations
 - d. Homework Assignments
 - e. Group & Individual Activities
 - f. Laboratory & Greenhouse Activities
 - g. Quizzes, Tests & Final Exam
 - h. Guest Speakers
 - i. Field Trips
 - j. Internet Exploration
 - k. Field Work
- d. Instructional materials: Horticulture, Prentice-Hall; Sunset, Western Garden Book
- e. Certificates: None