

COURSE OUTLINE DEVELOPMENT

COURSE OUTLINE

1. **Course Title:** Viticulture and Environmental Science

2. **CBEDS Title:**

3. **CBEDS Number:**

4. **Job Titles:**

**Agriculture & Food Science Technician
Agricultural Engineers and Inspectors
Agriculture Workers and Managers**

**Agronomist
Enologist
Lab Technician**

5. **Course Description:**

This is a year-long, advanced course in the Agriculture Pathway and is designed to provide the student with theories and principles related to viticulture and environmental science. Students will demonstrate laboratory skills that include but are not limited to soil, water and fruit analysis techniques, vine propagation, pruning, canopy and trellising systems, pest and climate control, resource management, and business skills which are the basis for grape growing operations. This course is intended to successfully prepare students for entry-level positions as well as those who plan on majoring in agricultural sciences at a four-year college and/or university. This course includes classroom instruction, practical lab work, research reports and field trips.

Student Outcomes and Objectives:

Students will:

1. Develop an appreciation of viticulture.
2. Incorporate scientific methods and biological principles with modern agricultural practices.
3. Demonstrate an awareness of the importance of viticulture.
4. Describe cell theory and its application to the organization of all organisms.
5. Recognize plant physiology, growth requirements, and nutrients needed for optimum plant growth.
6. Recognize the diversity of life and interrelationships among all organisms.
7. Describe the impact of the viticulture industry on the local and state economy.
8. Describe the historical and descriptive nature of the viticulture industry.
9. Acquire agricultural and biological vocabulary, and the reading, writing and critical thinking skills pertaining to the science.
10. Be prepared for college level entry in the various disciplines of viticulture.

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 or Agriculture Biology
Skill Building	Environmental Horticulture
Advanced Skill	Viticulture

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

7. Prerequisites: Algebra 1 or concurrent enrollment, Ag Science Basic Core or Agriculture Biology, Environmental Horticulture or by teacher approval.

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

9. Course Outline

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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. 	<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, (9/10) R2.1,2.3,2 W2.5 LC1.4 LS 1.1, 2.3 (11/12) R2.3 W2.5 LC1.2 <u>Math</u> (7) NS1.2, 1.7 MR 1.1,1.3 2.7,2.8, 3.1</p>	<p>Lang. Arts R 8.2.1 (9/10) R 2.1, 2.3 W2.5 Math (7) NS 1.2, 1.3, 1.7 MR 1.1, 2.1, 3.1</p>

<p>2. Use and apply critical thinking and decision making skills 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
<p>A. Agricultural Effects of Environmental Ecology</p> <ol style="list-style-type: none"> 1. Categories and sources of pollution 2. Conserving natural and water resources 3. Agricultural practices beneficial and harmful to the environment 4. Chemical erosion & physical properties 5. Ecosystems 6. The Nitrogen Cycle 7. The Carbon Cycle 8. Water Cycle 	12	Agriculture & Natural Resources Industry E1.0, E1.1, E1.3	H/SC. 11; US History; 11.2	
<p>B. Plant Reproduction</p> <ol style="list-style-type: none"> 1. Asexual reproduction 2. Sexual reproduction 	10	Agriculture & Natural Resources Industry G4.0, G4.1	S. 8; Physical Science 6	S. 9-12; Biology ; 1
<p>C. Nature of Life</p> <ol style="list-style-type: none"> 1. Attributes of living organisms 2. Chemical and physical bases of plant life 3. Chemical components of protoplasm 	10		S. 9-12; Biology; 2	
<p>D. Plant Physiology and Growth</p> <ol style="list-style-type: none"> 1. Function of plant cells 2. Examination of cell wall and function 3. Cellular reproduction 4. DNA, RNA and synthesis of proteins 5. Introduction of root, stem and leaf structures and functions 6. Plant growth requirements 7. Environmental factors on growth 8. Specialized roots, stems and leaves 9. Requirements for seed germination 10. Plant hormones 11. Phytochrome 12. Photoperiodism 13. Environmental modifications for growth 14. Managing plant growth 	22	Agriculture & Natural Resources Industry E8.0, E8.2, E8.4	S. 8; Physical Science 6	
<p>E. Plant Pathology and Entomology</p> <ol style="list-style-type: none"> 1. Common diseases 2. Effect on development and growth 3. Method of controls 4. Orders of Insects 5. Insect structure and development 6. IPM practices 	20	Agriculture & Natural Resources Industry F4.0, Fr.3, F4.4, G5.0, G5.4	S. 8; Physical Science 6c S. 8; Physical Science 9	
<p>F. Biotechnology Applications in Viticulture</p> <ol style="list-style-type: none"> 1. Biotechnology 2. Molecular biotechnology: genetic importance 3. Genetic engineering 4. Tissue culture 	12	Agriculture & Natural Resources Industry G11.0, G11.5	H/SC 12; Econ.; 12.2.2	
<p>G. Soil Structure and Function</p> <ol style="list-style-type: none"> 1. Components, function, economic uses, and relationship to the earth 2. Geologic Cycle 3. Chemical and physical weathering 4. Soil formation 	12	Agriculture & Natural Resources Industry Sector G6.0		

Instructional Units and Competencies	Hours	Model Curr. Standards.	CA Academic Standards	CAHSEE
H. Plant Nutrients 1. Primary, secondary, and micro-nutrients 2. Function of nutrients in plant growth 3. Nutrient deficiencies and symptoms 4. PH requirements and effects on plant life 5. Nitrogen fixation and absorption 6. Modifying growth	8	Agriculture & Natural Resources Industry G3.0, G3.4		
I. Plant Names and Classifications 1. Development of the binomial system of nomenclature 2. Development of kingdom concept 3. Classification of major groups of plants 4. Synoptic key to major groups of plants	8	Agriculture & Natural Resources Industry G1.0, G1.1		
J. Introduction to Seed Plants: Gymnosperms 1. Human and ecological relevance of gymnosperms 2. Examination of four major divisions of gymnosperms 3. History of gymnosperms	12	Agriculture & Natural Resources Industry F2.0, F2.3		
K. Flowering Plants 1. Structure and reproduction of flowering plants 2. Trends of specialization and classification in flowering plants 3. Division Anthophyta 4. Plant preservation	12	Agriculture & Natural Resources Industry G1.0		
L. Fruits and Seeds 1. Kinds of fruits 2. Fruit and seed dispersal 3. Seed structure 4. Longevity of seeds and fruits	12	Agriculture & Natural Resources Industry C1.0		
M. History of the Wine Grape 1. Origin of cultivated grapes 2. Selected fruit for Region or Appellation 3. Agricultural and urban environment influence 4. History of Sonoma and Napa County wine industry	10	Agriculture & Natural Resources Industry G10.1, G10.3		
N. Plant Research Project 1. Development of viticulture/environmental science projects 2. Statistical management of project via Record Book 3. Instructional coordination and supervision 4. analysis of project results	20+ Out of class time	Agriculture & Natural Resources Industry 10.2, 11.0		
O. Professional Opportunities in Viticulture 1. Enologist and research fields 2. Production Management and Growing Occupations	6	Agriculture & Natural Resources Industry 3.0		
P. Agricultural Interpersonal and Leadership Development 1. Completion of a Supervised Agricultural Experience Program and data collection 2. Development of listening, speaking, writing and reading skill activities 3. Critical thinking and group team building activities 4. Agriculture presentations	4	Agriculture & Natural Resources Industry G3.0, G3.4		

10. Additional recommended/optional items

- a. Articulation: None
- b. Academic credit: 10 units for the year
- c. Instructional strategies:

Methods of Instruction:

- a. Lecture and Discussion
- b. Audio visual materials
- c. Research Readings & Written Presentations
- d. Homework Assignments
- e. Group & Individual Activities
- f. Laboratory Investigation – 1 per week (20% of grade)
- g. Discussion & Group Dynamics
- h. Quizzes, Tests & Final Exam
- i. Guest Speakers
- j. Field Trips
- k. Internet Exploration
- l. Seminar Presentation

Assessment Methods:

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| a. Quizzes, Tests, Final Exam | 40% |
| b. Laboratory investigation and write-ups | 20% |
| c. Writing assignments | 10% |
| d. Leadership & critical thinking activities | 5% |
| e. Research report and seminar presentation | 20% |
| f. Supervised Agricultural Experience project & Record Book | 5% |

Laboratory Activities:

- a. The Scientific Method
- b. Analyzing ecosystems
- c. Genotypic and phenotypic ratios
- d. Cell identification
- e. Flower dissection and pollen growth germination
- f. Secondary and microelements with N-P-K tissue tests on plants
- g. Water germination test
- h. Cold germination test
- i. Determining salt tolerance
- j. Factors affecting photosynthesis
- k. Effects of leaf surface area, air movement, and light on transpiration rates
- l. Effects of light quality on plant growth
- m. Geotropism
- n. Phototropism
- o. The Hydrologic cycle
- p. Comparison of soil vs. non-soil plant culture
- q. Effects of chemical (herbicides) on plants
- r. Herbicide biopsy
- s. Effects of rooting hormone on root development
- t. Effects of gibberellic acid on seed germination
- u. Anther culture
- v. DNA extraction
- w. Probability of train inheritance
- x. Tissue culture
- y. Seed dispersal
- z. Genetic probability
- aa. Insect identification
- bb. Environmental forcing structures
- cc. Comparison of asexual propagation methods
- dd. Water quality

- ee. Plant pigment chromatography
- d. Instructional materials:

Cox, Jeff (1994). From Vines to Wines, Storey Books, Pownal, VT.
Stern, K. (1998). Plant Biology – 5th Edition, Wm. C. Brown Publishing, NY, NY
Arms. K (1996). Environmental Science, Harcourt Brace & company, Orlando, FL
Winkler, Book, Kliewer, Lider, (1974). General Viticulture
University of California, Davis, Davis & California Department of Education (1991).

The following items are commonly used as supplementary materials and are coordinated with the adopted course objectives:

CDE Biological Science Content Standards

Research Handouts

Videos

DVD's

Internet

- e. Certificates: None