

## CTE/ROP Horticulture

### San Diego County Office of Education - Sweetwater Union High School District Pacing Guide/Course Description

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| <b>Course Length:</b> 1 Semester  | <b>Classroom Instruction:</b> 90 hours                 |
| <b>SUHSD Course Number:</b>   | <b>Grade Level:</b> 9, 10, 11, 12                      |
| <b>SDCOE Course Number:</b> 405075  | <b>SDCOE Total Hours:</b> 222                          |
| <b>CBEDS Number/Title:</b>  | <b>Year of Implementation:</b> 2012                    |
| <b>Course Pre-requisites:</b> None  | <b>Articulation (school/credits):</b>                  |
| <b>CTE Industry Sector:</b> Agriculture and Natural Resources   | <b>CTE Pathway(s):</b> Ornamental Horticulture Pathway |
| <b>Job Titles:</b> Nursery Worker, Landscape Architect, Landscape Designer, Landscape Contractor  |  |
| <b>Credential Information:</b> Preliminary or Clear Full-Time Designated Subjects CTE Teaching Credential in Agriculture and Natural Resources  |  |
| <b>Required Textbooks:</b> Introduction to Horticulture   |  |
| <b>Course Description:</b> This course provides terminology and training for occupations in the landscape industry. Employment possibilities include nursery worker, landscape designer, landscape maintenance or installation personnel. Instruction covers the following areas: plant structures, processes, classification, climatic influences, maintenance and propagation. Students may use computers in the class. This course meets the prerequisite requirements for enrollment in Landscape Design. Students must pass Horticulture with a "B" or better to take the next level advanced ornamental horticulture classes. |  |

## **CTE/ROP Horticulture**

### **Semester 1**

Unit 1: General Horticulture

Unit 2: Role of Plants

Unit 3: Job Search Instruction

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| Semester 1 - Unit 1 – General Horticulture (62 hours)   |  |  |   |  |
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| Competencies  | Standards  | Suggested Pacing   | Essential Vocabulary  | Resources/Materials  |
| <p><b>1A</b> - Understands the six major plant parts including roots, stems, leaves and flowers, fruit, and seeds and list their functions.</p> <p><b>1B</b> - Describe the role and processes of photosynthesis, respiration, and tropisms and how they affect plant growth.</p> <p><b>1C</b> - Understand the system of plant taxonomy, and the origin of scientific names. Identify and describe 7 plant families and 3 plants in each. List their scientific name, common name and classification as annual, biennial and perennial.</p> <p><b>1D</b> - Understand that all plants require varying amounts of light, water, nutrients, space and temperature depending on its native habitat. Students will reiterate this information for common ornamental plants</p> <p><b>1E</b> - List the components of soil and their relationship to healthy plants. Understand water is essential to plant health and each plant has a different water requirement. Understand there are several methods to planting. Understand every plant has different fertilization needs. Performs a variety pruning</p> | <p><b>Career Technical Education:</b><br/>*ANR/OHP/</p> <p><b>1.1</b> Understand how to classify and identify plants by order, family, genus, and species.</p> <p><b>1.3</b> Understand how common plant parts are used to classify the plants.</p> <p><b>2.1</b> Understand plant systems, nutrient transportation, structure, and energy storage.</p> <p><b>2.2</b> Understand the seed's essential parts and functions.</p> <p><b>2.4</b> Understand the factors that influence plant growth, including water, nutrients, light, soil, air, and climate.</p> <p><b>2.5</b> Understand the tissues seen in a cross section of woody and herbaceous plants.</p> <p><b>2.6</b> Understand the factors that affect plant growth</p> <p><b>3.1</b> Understand the different forms of sexual and asexual plant reproduction.</p> <p><b>3.2</b> Understand the various techniques for successful plant propagation (e.g., budding, grafting, cuttings, seeds).</p> <p><b>3.3</b> Understand how to monitor plant reproduction for the development of a saleable product.</p> <p><b>4.1</b> Read and interpret pesticide labels and understand safe pesticide management practices.</p> <p><b>4.3</b> Understand common horticultural pests and diseases and methods of controlling them.</p> | <p><b>1A – 14 hours:</b><br/>Structure of Plants</p> <p><b>1B – 13 hours:</b><br/>Plant Processes</p> <p><b>1C – 5 hours:</b><br/>Plant Classification</p> <p><b>1D – 5 hours:</b><br/>Climatic influences</p> <p><b>1E – 15 hours:</b><br/>Plant Maintenance</p> <p><b>1F – 10 hours:</b><br/>Plant Maintenance</p> | <p>Annual<br/>Apical meristem<br/>Axillary bud<br/>Biennial<br/>Botanical nomenclature<br/>Botanist<br/>Broadleaf<br/>Calyx<br/>Cambium<br/>Chlorophyll<br/>Complete flower<br/>Compound leaf<br/>Cotyledons<br/>Cross-pollination<br/>Cultivar<br/>Deciduous plant<br/>Dicot<br/>Dormancy<br/>Endosperm<br/>Evergreen<br/>Fertilization<br/>Fibrous root system<br/>Flower<br/>Fruit<br/>Germination<br/>Hardiness<br/>Hybrid<br/>Imperfect flower<br/>Incomplete flower<br/>Inflorescence<br/>Monocot<br/>Morphology<br/>Perennial<br/>Perfect flower<br/>Phloem<br/>Photosynthesis</p> | <p><b>Teacher and Student Resources:</b><br/>Textbook:<br/>1. Introduction to Horticulture Revised Fourth Edition, Pearson Education Inc. 2009</p> |

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| <p>methods. Understand Integrated Pest Management techniques.</p> <p><b>1F</b> - Propagate plants from seed, bulbs, rhizomes (roots), stems and vegetative cuttings.</p> | <p><b>4.4</b> Understand the systematic approach to solving plant problems.</p> <p><b>5.1</b> Understand how basic soil science and water principles affect plant growth.</p> <p><b>5.3</b> Prepare and amend soils, implement soil conservation methods, and compare results.</p> <p><b>5.4</b> Understand major issues related to water sources and water quality.</p> <p><b>6.1</b> Analyze how primary and secondary nutrients and trace elements affect ornamental plants.</p> <p><b>6.2</b> Understand basic nutrient testing procedures on soil and plant tissue.</p> <p><b>6.3</b> Analyze organic and inorganic fertilizers to understand their appropriate uses.</p> <p><b>6.4</b> Understand how to read and interpret labels to properly apply fertilizers.</p> <p><b>Core Academic:</b><br/> <b>*ANR/A/1.2S/IE/G9-12/</b><br/> <b>(1.a)</b> Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.<br/> <b>(1.c)</b> Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br/> <b>(1.d)</b> Formulate explanations by using logic and evidence.<br/> <b>(1.f)</b> Distinguish between hypothesis and theory as scientific terms.<br/> <b>(1.j)</b> Recognize the issues of statistical variability and the need for controlled tests.<br/> <b>*ANR/C/2.1R/RC/G9-12/</b><br/> <b>(2.6)</b> Demonstrate use of sophisticated learning tools by</p> |  | <p>Pith<br/> Pollination<br/> Primary root<br/> Reproductive phase<br/> Root cap<br/> Root hairs<br/> Scientific name<br/> Secondary root<br/> Seed<br/> Seed coat<br/> Seed embryo<br/> Simple leaf<br/> Stem tubers<br/> Stomata<br/> Taproot system<br/> Transpiration<br/> Vegetative phase<br/> Woody plant<br/> Xylem</p> <p>Asexual propagation<br/> Budding<br/> Callus<br/> Clone<br/> Damping-off<br/> Direct seeding<br/> Division<br/> Genetic engineering<br/> Grafting<br/> Harden-off<br/> Indirect seeding<br/> Layering<br/> Leaf-bud cutting<br/> Leaf cutting<br/> Plant crown<br/> Plantlet<br/> Plant propagation<br/> Root cuttings<br/> Scarification<br/> Scion<br/> Seedling<br/> Separation</p> |  |
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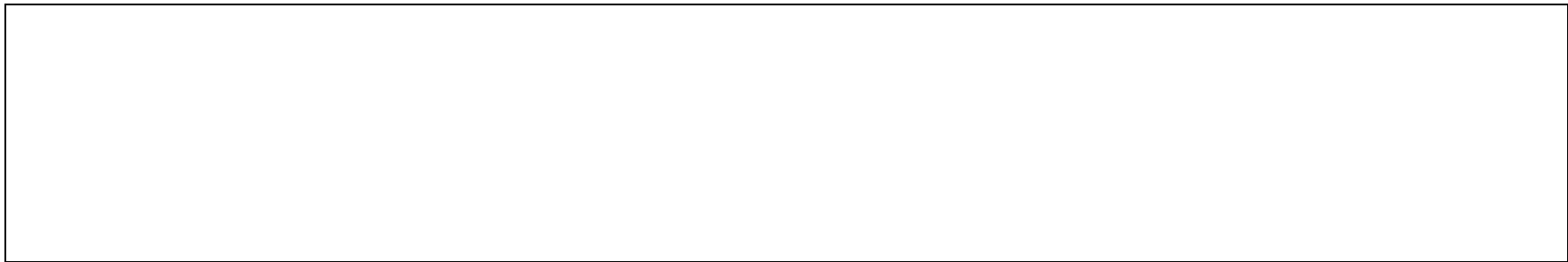
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|  | <p>following technical directions (e.g., those found with graphic calculators and specialized software programs and in access guides to World Wide Web sites on the Internet).</p> |  | <p>Sexual propagation<br/>Stem cuttings<br/>Stratification<br/>Tissue culture<br/>Understock</p> <p>Active ingredient<br/>Anchor<br/>Chlorosis<br/>Complete fertilizer<br/>Edaphology<br/>Elemental fertilizer<br/>Fertigation<br/>Fertilizer<br/>Filler ingredient<br/>Growing medium<br/>Hydroponics<br/>Inert Ingredient<br/>Leaching<br/>Loam<br/>Macronutrient<br/>Micronutrient<br/>Mineral material<br/>nutrient<br/>Organic matter<br/>pH<br/>Soil<br/>Soil aeration<br/>Soil amendment<br/>Soil compaction<br/>Soilless medium<br/>Soil profile<br/>Soil structure<br/>Soil test<br/>Soil texture<br/>Thatch</p> <p>Best management<br/>practices (BMP's)<br/>Biological pest control<br/>Chemical pest control<br/>endemic</p> |  |
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|   |  |  | Fungi<br>Fungicide<br>Genetic pest control<br>Herbicide<br>Host<br>Insect<br>Insecticide<br>Integrated pest management (IPM)<br>Larvae<br>Mechanical pest control<br>Moss<br>Nematicide<br>Nematode<br>Pathogen<br>Pest<br>Pesticide<br>Plant disease<br>Postemergence<br>Preemergence<br>Pupae<br>Surfactant<br>Viruses<br>Weed |  |
| <p><b>Suggestions/Assessments:</b></p> <ul style="list-style-type: none"> <li>• Practical Lab for structure of plants, each plant part</li> <li>• Practical lab for plant processes</li> <li>• Written test for plant identification</li> <li>• Practical lab for climatic influences</li> <li>• Practical lab for Plant maintenance</li> <li>• Practical lab for plant propagation</li> <li>• Written Unit test</li> </ul> <p><b>Comments:</b></p> |  |  |  |  |

## CTE/ROP Horticulture



| <u>Semester 1 - Unit 2 – Plants in the Environment (18 hours)</u>   |  |  |   |  |
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| Competencies  | Standards  | Suggested Pacing   | Essential Vocabulary  | Resources/Materials  |
| <p><b>2A</b> - Understand that plants have a functional use, such as a source of food, building material, landscape industry. Describes, in terms of design, the aesthetic use of plants.</p> <p><b>2B</b> - Identify and demonstrate the role of plants in the environment and how this affects humans, maintains the ecosystems, and the reason for sustainable practices in horticulture</p> | <p><b><u>Career Technical Education:</u></b><br/> <b>*ANR/OHP/</b><br/> <b>F1.5</b> Understand plant selection and identification for local landscape applications.<br/> <b>F3.3</b> Understand how to monitor plant reproduction for the development of a saleable product.<br/> <b>F4.2</b> Understand how pesticide regulations and government agencies affect agriculture.<br/> <b>F4.4</b> Understand the systematic approach to solving plant problems.<br/> <b>F5.4</b> Understand major issues related to water sources and water quality.<br/> <b><u>Core Academic:</u></b><br/> <b>*ANR/A/1.2S/IE/G9-12/</b><br/> <b>(1.m)</b> Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use</p> | <p><b>2A – 13 hours:</b><br/>Use of Plants</p> <p><b>2B – 5 hours:</b><br/>Role of Plants in the Environment</p> | <p>Agriculture<br/>           Botany<br/>           Floriculture<br/>           Foliage plant<br/>           Horticulture<br/>           Horticulture industry<br/>           Horticulture science<br/>           Horticulture technology<br/>           Interiorscaping<br/>           Landscape horticulture<br/>           Nursery<br/>           Olericulture<br/>           Ornamental horticulture<br/>           Pomology</p> <p>Chaparral<br/>           Coastal sage scrub<br/>           Coastal wetland<br/>           Endangered Environment<br/>           Eutrophication<br/>           Habitat</p> | <p><b><u>Teacher &amp; Student Resources:</u></b><br/>           *Textbooks:<br/>           Introduction to Horticulture, Revised Fourth Edition</p> |

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|   | <p>decisions in California.<br/> <b>*ANR/C/2.2W/WSA/G11-12/</b><br/> <b>(1.3)</b> Structure ideas and arguments in a sustained, persuasive, and sophisticated way and support them with precise and relevant examples.<br/> <b>*ANR/C/2.4LS/LSSA/G9-10/</b><br/> <b>(1.1)</b> Formulate judgments about the ideas under discussion and support those judgments with convincing evidence.</p> |  | <p>Hydrologic cycle<br/> Infiltration<br/> Inland wetland<br/> Intensive land use<br/> Macroenvironment<br/> Microenvironment<br/> Native<br/> Nitrogen cycle<br/> Nonpoint source pollution<br/> Plant environment<br/> Point source pollution<br/> Pollution<br/> Sustainable<br/> Urban farming<br/> Urban runoff<br/> Vernal pool<br/> Watershed<br/> Wetland<br/> Wildlife</p> |  |
| <p><b>Suggestions/Assessments:</b></p> <ul style="list-style-type: none"> <li>• Written test for use of plants</li> <li>• Written test for role of plants in the environment</li> </ul> <p><b>Comments:</b></p> <ul style="list-style-type: none"> <li>• Any of these chapters lend themselves to a myriad of projects and activities that will enhance the learning. Some suggested ideas include PowerPoint presentations, Botanical coloring book, collaborative posters.</li> <li>• Environmental Jeopardy game is great for pre-test review. This can either be done individually or better yet as a class activity by dividing the class into team A and Team B.</li> </ul> |  |  |   |  |



## CTE/ROP Horticulture

| Semester 1 - Unit 3 – Job Search Instruction (10 hours)   |   |                                |   |   |
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| Competencies  | Standards   | Suggested Pacing               | Essential Vocabulary  | Resources/Materials   |
| <p><b>3A</b> - Accessing and utilizing technology and information</p> <p><b>3B</b> - Practicing occupational safety standards</p> <p><b>3C</b> - Thinking critically and solving problems effectively</p> <p><b>3D</b> - Using basic skills in reading, writing, mathematics, listening and speaking as they relate to occupation specific skills</p> <p><b>3E</b> - Attaining a comprehensive understanding of all aspects of industry the individual is preparing to enter</p> <p><b>3F</b> - Applying knowledge to real world problems and situations</p> <p><b>3G</b> - Works independently and collaboratively.</p> <p><b>3H</b> - Communicates effectively and appropriately.</p> <p><b>3I</b> - Performs reliably and responsibly.</p> <p><b>3J</b> - Working with diverse populations effectively and respectfully.</p> <p><b>3K</b> - Is punctual</p> <p><b>3L</b> - Follows directions</p> <p><b>3M</b> - Works well with minimum supervision</p> <p><b>3N</b> - Is cooperative</p> <p><b>3O</b> - Takes initiative by working beyond minimum</p> | <p><b>Core Academic:</b><br/> <b>*ANR/A/1.2S/IE/G9-12/</b><br/> <b>(1.a)</b> Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.<br/> <b>(1.c)</b> Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br/> <b>(1.d)</b> Formulate explanations by using logic and evidence<br/> <b>(1.f)</b> Distinguish between hypothesis and theory as scientific terms<br/> <b>*ANR/C/2.1R/RC/G9-10/</b><br/> <b>(2.3)</b> Generate relevant questions about readings on issues that can be researched<br/> <b>*ANR/C/2.2/W/WSA/G9-10/</b><br/> <b>(1.3)</b> Use clear research questions and suitable research methods (e.g., library, electronic media, personal interview) to elicit and present evidence from primary and secondary sources<br/> <b>(2.5a)</b> Provide clear and purposeful information and address the intended audience appropriately<br/> <b>(2.5b)</b> Use appropriate vocabulary, tone, and style to take into account the nature of the relationship with, and the knowledge and interests of, the recipients<br/> <b>(2.5c)</b> Highlight central ideas or</p> | <p><b>3A-T – 10 hours:</b></p> | <p>Activist<br/> Agriculture<br/> Arboretum<br/> Biomonitor<br/> Botanical garden<br/> Environmentalist<br/> Floriculture<br/> Garden Center<br/> Goal Setting<br/> Horticulturalist<br/> Interiorscaping<br/> Interview<br/> Landscape Contractor<br/> Landscape Designer<br/> Landscape Architect<br/> Nursery Worker<br/> Personal protective equipment<br/> Personal skills<br/> Restoration Specialist<br/> Safety<br/> Supervised<br/> Experience<br/> Urban Farmer<br/> Urban Forester<br/> Work habit</p> | <p><b>Teacher &amp; Student Resources:</b><br/> *Textbooks:<br/> Introduction to Horticulture, Revised Fourth Edition</p> |

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| <p>requirements.<br/> <b>3P</b> - Meets job standards of neatness and grooming.<br/> <b>3Q</b> - Responds appropriately to constructive criticism.<br/> <b>3R</b> - Completing an appropriate resume and job application.<br/> <b>3S</b> - Acquiring job interview techniques.<br/> <b>3T</b> - Attaining awareness of advanced career and educational opportunities and the need for continuous education.</p> | <p>images<br/> <b>(2.5d)</b> Follow a conventional style with page formats, fonts, and spacing that contribute to the documents' readability and impact<br/> <b>(2.6)</b> Report information and convey ideas logically and correctly<br/> <b>*ANR/C/2.3/WO/ELC/G11-12/</b><br/> <b>(1.1)</b> Demonstrate control of grammar, diction, and paragraph and sentence structure and an understanding of English usage<br/> <b>(1.2)</b> Produce legible work that shows accurate spelling and correct punctuation and capitalization<br/> <b>(1.3)</b> Reflect appropriate manuscript requirements in writing<br/> <b>*ANR/C/2.4LS/LSSA/G9-10/</b><br/> <b>(1.1)</b> Formulate judgments about the ideas under discussion and support those judgments with convincing evidence<br/> <b>(1.7)</b> Use props, visual aids, graphs, and electronic media to enhance the appeal and accuracy of presentations<br/> <b>*ANR/C/2.4LS/LSSA/G11-12/</b><br/> <b>(1.8)</b> Use effective and interesting language<br/> <b>(2.4)</b> Deliver multimedia presentations<br/> <b>(2.4a)</b> Combine text, images, and sound by incorporating information from a wide range of media, including films, newspapers, magazines, CD-ROMs, online information, television, videos, and electronic media-generated images<br/> <b>(2.4b)</b> Select an appropriate medium for each element of the presentation<br/> <b>(2.4c)</b> Use the selected media skillfully, editing appropriately and monitoring for quality<br/> <b>(2.4d)</b> Test the audience's response</p> |  |  |  |
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|  | <p>and revise the presentation accordingly<br/> <b>*ANR/CPM/</b><br/> <b>(3.1)</b> Know the personal qualifications, interests, aptitudes, information, and skills necessary to succeed in careers<br/> <b>(3.2)</b> Understand the scope of career opportunities and know the requirements for education, training, and licensure<br/> <b>(3.3)</b> Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options<br/> <b>(3.4)</b> Understand the role and function of professional organizations, industry associations, and organized labor in a productive society<br/> <b>(3.5)</b> Understand the past, present, and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning<br/> <b>(3.6)</b> Know important strategies for self-promotion in the hiring process, such as job applications, résumé writing, interviewing skills, and preparation of a portfolio<br/> <b>*ANR/HS/</b><br/> <b>(6.1)</b> Know policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities<br/> <b>(6.2)</b> Understand critical elements of health and safety practices related to storing, cleaning, and maintaining tools, equipment, and supplies<br/> <b>(6.3)</b> Understand how to locate important information on a material safety data sheet<br/> <b>(6.4)</b> Maintain safe and healthful</p> |  |  |  |
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|   | <p>working conditions<br/><b>(6.5)</b> Use tools and machines safely and appropriately<br/><b>(6.6)</b> Know how to both prevent and respond to accidents in the agricultural industry</p> |  |  |  |
| <p><b>Suggestions/Assessments:</b></p> <ul style="list-style-type: none"><li>• Written test for use of plants</li><li>• Written test for role of plants in the environment</li></ul> <p><b>Comments:</b></p> <ul style="list-style-type: none"><li>• Any of these chapters lend themselves to a myriad of projects and activities that will enhance the learning. Some suggested ideas include PowerPoint presentations, Botanical coloring book, collaborative posters.</li><li>• Environmental Jeopardy game is great for pre-test review. This can either be done individually or better yet as a class activity by dividing the class into team A and Team B.</li></ul> |  |  |  |  |