

# FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



## Forestry and Environmental Resource Management 2

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| <b>CAC Approval Date: December 3, 2025</b><br><b>Board Approval Date: January 15, 2026</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Course Length: 2 Semesters</b>                                                                                                 |
| <b>Grading: A-F</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Credits: 5 Credits per Semester</b>                                                                                            |
| <b>Proposed Grade Level(s): 11, 12</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Subject Area: Interdisciplinary Science, CTE</b><br><b>Elective Area (if applicable):</b><br><b>Career Technical Education</b> |
| <b>Prerequisite(s):</b><br><b>Forestry and Environmental Resource</b><br><b>Management 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Corequisite(s):</b>                                                                                                            |
| <b>CTE Sector/Pathway: Agriculture</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                   |
| <b>Intent to Pursue 'A-G' College Prep Status: Yes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                   |
| <b>A-G Course Identifier: (d) Laboratory Science</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                   |
| <b>Graduation Requirement: No</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                   |
| <b>Course Intent: Site Specific</b><br><b>Program (if applicable): CTE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |
| <p style="text-align: center;"><b>Folsom Cordova Unified School District</b><br/><b>2024-2025 Nondiscrimination Statement</b></p> <p>The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, gender, gender identity, gender expression, immigration status, nationality, race or ethnicity, religion, sex, sexual orientation, or association with a person or a group with one or more of these actual or perceived characteristics. For questions or complaints, contact:</p> <p><b>Jim Huber, Ed.D., Assistant Superintendent, Educational Services</b><br/><b>Compliance Officer, Section 504 Coordinator, ADA Coordinator (students)</b><br/><b>jhuber@fcusd.org</b><br/><b>916-294-9000 x 104580</b></p> |                                                                                                                                   |

**Shannon Diaz, Director of Compliance  
Compliance Officer and Title IX Coordinator  
sdiaz@fcusd.org  
916-294-9000 x 104415  
1965 Birkmont Drive  
Rancho Cordova, CA 95742**

**The Folsom Cordova Unified School District does not discriminate on the basis of sex and prohibits sex discrimination in any education program or activity that it operates, as required by Title IX and its regulations, including in admission and employment.**

**Inquiries about Title IX may be referred to the Folsom Cordova Unified School District's Title IX Coordinator, the U.S. Department of Education's Office for Civil Rights, or both. The District Title IX Coordinator is:**

**Shannon Diaz, Director of Compliance  
Compliance Officer and Title IX Coordinator  
sdiaz@fcusd.org  
916-294-9000 x 104415  
1965 Birkmont Drive  
Rancho Cordova, CA 95742**

**The District nondiscrimination policy can be located at:**

**<https://www.fcusd.org/district/about-us/nondiscrimination-statementpolicy>**

**The District's nondiscrimination complaint procedures can be located at:**

**Students: <https://www.fcusd.org/departments/compliance/complaints/uniform-complaints>**

**Staff: <https://www.fcusd.org/departments/compliance/complaints/nondiscrimination-in-employment>**

**To report information about conduct that may constitute sex discrimination or sex-based harassment, or make a complaint of sex discrimination or sex-based harassment under Title IX, please refer to:**

**Students: <https://www.fcusd.org/district/about-us/title-ix-notificationsexual-harassment>**

**Staff: <https://www.fcusd.org/departments/compliance/complaints/sexual-harrassment-title-ix>**

## **COURSE DESCRIPTION:**

**This concentrator-level course expands on foundational forestry and natural resource concepts, guiding students through the applied sciences that govern forest ecosystems and land management. Students investigate the chemistry, ecology, and physical science of forests through hands-on experiments, field data collection, and project-based applications. Key topics include forest ecology, fire behavior, soil and water chemistry, watershed management, climate science, and sustainable forest practices. Students integrate scientific reasoning and technical skills to monitor, analyze, and propose solutions for maintaining healthy forests and mitigating environmental threats. This course meets laboratory science requirements under the California Agriculture & Natural Resources Pathway and serves as preparation for advanced study or entry into careers in forestry, fire ecology, or environmental management.**

## **DETAILED UNITS OF INSTRUCTION:**

| <b>Unit Number/Title</b>                                                                                                                                                                                                                                                                                                    | <b>Unit Essential Questions</b>                                                                                                                                                                                                                                                                                | <b>Examples of Formative Assessments</b>                                                                                                                                                                                                                                                                                                                                                                    | <b>Examples of Summative Assessment</b>                                                                                                                                                                        |
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| <b>1. Introduction to Forest Ecology and Systems</b>                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>*How do biotic and abiotic factors interact to create and maintain forest ecosystems?</li> <li>*What roles do energy flow and nutrient cycling play in forest productivity?</li> <li>*How does ecological succession shape forest composition over time?</li> </ul>     | <ul style="list-style-type: none"> <li>*Create a labeled systems diagram illustrating energy flow and nutrient cycling within a local forest ecosystem.</li> <li>*Conduct a short field or virtual observation identifying producers, consumers, and decomposers and their interactions.</li> <li>*Write a reflection comparing two types of forest ecosystems (e.g., coniferous vs. deciduous).</li> </ul> | <ul style="list-style-type: none"> <li>*Develop an ecosystem profile report analyzing the interdependence of abiotic and biotic factors in a selected forest biome, supported with data or visuals.</li> </ul> |
| <b>HS-LS2-3:</b> Cycling of matter and flow of energy<br><b>HS-LS2-7:</b> Reducing human impacts<br><b>C14.1:</b> Analyze forest ecosystems and the interdependence of living and nonliving components<br><b>RST.11-12.1:</b> Cite evidence in science texts<br><b>WHST.11-12.9:</b> Draw evidence from informational texts |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                |
| <b>2. Forest Chemistry and Soil Science</b>                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>*How do chemical and physical properties of soil influence forest growth and health?</li> <li>*In what ways do decomposition and nutrient cycling affect soil fertility?</li> <li>*How can understanding soil chemistry guide sustainable forest management?</li> </ul> | <ul style="list-style-type: none"> <li>*Perform a soil test (pH, texture, and organic matter) and record findings in a lab journal.</li> <li>*Compare nutrient content between different soil samples and infer implications for plant growth.</li> <li>*Short quiz on chemical cycles (carbon, nitrogen, and phosphorus).</li> </ul>                                                                       | <ul style="list-style-type: none"> <li>*Lab-based investigation report analyzing soil composition and its influence on forest productivity, including recommendations for management practices.</li> </ul>     |
| <b>HS-ESS2-2:</b> Geoscience feedback and Earth systems<br><b>ESS2.C:</b> Roles of water in Earth's surface processes<br><b>PS3.B:</b> Conservation of energy and transfer<br><b>C10.2:</b> Summarize soil properties (pH, texture, salinity)<br><b>C10.3:</b> Assess irrigation and water delivery options                 |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                |
| <b>3. Fire Ecology and Behavior</b>                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>*What are the chemical and physical processes that drive fire behavior?</li> </ul>                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>*Analyze fire triangle components using a simulation or model activity.</li> </ul>                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>*Fire behavior scenario analysis — students design a management</li> </ul>                                                                                              |

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|                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>*How can fire serve both destructive and regenerative roles in ecosystems?</li> <li>*What factors influence fire intensity, spread, and ecological impact?</li> </ul>                                                                                                   | <ul style="list-style-type: none"> <li>*Map case studies of historical wildfires and identify contributing environmental and human factors.</li> <li>*Discussion board: “Is fire a friend or foe in forest ecosystems?”</li> </ul>                                                                                                          | plan explaining ignition sources, spread potential, suppression strategies, and ecological outcomes                                                               |
| <p><b>HS-ESS3-1:</b> Explain how natural hazards influence human activity</p> <p><b>HS-ESS3-4:</b> Evaluate technological solutions reducing impacts</p> <p><b>C15.1:</b> Describe fire behavior and suppression methods</p> <p><b>C15.3:</b> Evaluate prescribed fire as a management tool</p> <p><b>C14.3:</b> Evaluate sustainability practices</p>                                     |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                   |
| <b>4. Watershed and Air Quality Management</b>                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>*How do forests regulate water quality and supply within a watershed?</li> <li>*What are the primary sources and impacts of air and water pollution in forested regions?</li> <li>*How can management practices balance human use with ecosystem protection?</li> </ul> | <ul style="list-style-type: none"> <li>*Conduct a small-scale water quality test (e.g., pH, turbidity, dissolved oxygen).</li> <li>*Model how pollutants travel through a watershed using a hands-on or digital simulation.</li> <li>*Journal reflection on local water conservation practices.</li> </ul>                                  | *Create a watershed health report for a regional system, including maps, pollutant data, and proposed management strategies to improve water and air quality.     |
| <p><b>HS-ESS3-1:</b> Natural resources, hazards, and climate effects</p> <p><b>HS-ESS3-4:</b> Technological solutions to environmental impacts</p> <p><b>ESS3.A:</b> Natural Resources</p> <p><b>ESS3.C:</b> Human Impacts on Earth Systems</p> <p><b>C2.1:</b> Environmental impacts on soil, water, and air</p> <p><b>C2.4:</b> Conservation of renewable and nonrenewable resources</p> |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                   |
| <b>5. Forest Management Practices</b>                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>*How do silvicultural practices promote forest regeneration and sustainability?</li> <li>*What are the trade-offs between economic interests and ecological preservation?</li> <li>*How can data-driven management support biodiversity and forest health?</li> </ul>   | <ul style="list-style-type: none"> <li>*Compare management techniques (clear-cutting, selective harvest, shelterwood) using case studies.</li> <li>*Field notebook exercise recording tree measurements (DBH, height) and estimating forest density.</li> <li>*Debate: “Should forest management prioritize economy or ecology?”</li> </ul> | *Develop a short-term forest management plan that balances ecological health and economic output, including site data, silvicultural methods, and justifications. |

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| <b>HS-LS2-7:</b> Design/refine solutions reducing human impact<br><b>HS-ESS3-4:</b> Evaluate management technologies<br><b>C1.0:</b> Role of ag & natural resources in economy<br><b>C3.0 &amp; C3.5:</b> Analyze tech's effects and integrate data tools<br><b>C14.3:</b> Evaluate management practices for sustainability |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                     |
| <b>6. Climate Interactions and Environmental Monitoring</b>                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>*How do forests influence and respond to changing climate conditions?</li> <li>*What technologies and data collection methods help monitor environmental change?</li> <li>*How can carbon cycling and sequestration be used to mitigate climate impacts?</li> </ul>                      | <ul style="list-style-type: none"> <li>*Graph and interpret climate data (temperature, precipitation) over time for forested regions.</li> <li>*Research short article: "How forests act as carbon sinks."</li> <li>*Practice using monitoring tools or simulated data collection (e.g., GPS, satellite imagery).</li> </ul> | <ul style="list-style-type: none"> <li>*Research-based presentation explaining how climate change affects forests globally and proposing monitoring or mitigation strategies specific to a chosen biome.</li> </ul> |
| <b>HS-ESS2-2:</b> Feedback causing Earth system changes<br><b>HS-ESS3-1:</b> Climate change impacts on human activity<br><b>C2.2:</b> Environmental challenges related to agriculture<br><b>C13.2:</b> Analyze environmental problems and devise solutions                                                                  |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                     |
| <b>7. Restoration and Conservation Practices</b>                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>*What are the key strategies for restoring degraded forest and natural systems?</li> <li>*How do reforestation, erosion control, and habitat restoration promote ecosystem resilience?</li> <li>*What role do humans play in repairing and maintaining environmental balance?</li> </ul> | <ul style="list-style-type: none"> <li>*Identify and classify examples of local conservation and restoration projects.</li> <li>*Hands-on propagation or erosion control demonstration.</li> <li>*Case study analysis: Evaluate the success of a restoration effort.</li> </ul>                                              | <ul style="list-style-type: none"> <li>*Design a proposal for a restoration or conservation project that includes goals, methods, anticipated outcomes, and sustainability metrics.</li> </ul>                      |
| <b>HS-LS2-7:</b> Design/refine environmental solutions<br><b>HS-ESS3-4:</b> Evaluate technologies reducing impacts<br><b>C2.4:</b> Compare conservation practices<br><b>C14.3:</b> Evaluate sustainable management<br><b>C13.2:</b> Apply the scientific method to real problems                                            |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                     |
| <b>8. Field Studies and Applied Projects</b>                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>*How can scientific inquiry and field data inform natural resource management decisions?</li> <li>*What ethical</li> </ul>                                                                                                                                                               | <ul style="list-style-type: none"> <li>*Develop a field data collection plan (objectives, materials, methods).</li> <li>*Conduct peer review of project proposals for clarity</li> </ul>                                                                                                                                     | <ul style="list-style-type: none"> <li>*Capstone-style project: Compile a comprehensive field report synthesizing ecological data,</li> </ul>                                                                       |

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|                                                                                                                                                                                                                                                                                                           | considerations should guide conservation and land use projects?<br>*How can students apply classroom learning to real-world forestry and fire science challenges? | and feasibility.<br>*Keep a weekly reflection journal connecting field observations to classroom learning. | management recommendations, and reflection on human–environment interaction. |
| <b>HS-LS2-7; HS-ESS3-4:</b> Applied human–environment solutions<br><b>C13.0–C13.2:</b> Design experiments using the scientific method<br><b>C3.5:</b> Integrate technology in data collection/analysis<br><b>WHST.11-12.7:</b> Conduct research projects<br><b>WHST.11-12.9:</b> Draw evidence from texts |                                                                                                                                                                   |                                                                                                            |                                                                              |

## **RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:**

### **Link to Common Core Standards (if applicable):**

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

### **Link to Framework (if applicable):**

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

### **Link to Subject Area Content Standards (if applicable):**

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/ci/ct/sf/documents/agnatural.pdf>

### **Link to Program Content Area Standards (if applicable):**

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

<https://www.cde.ca.gov/ci/ct/sf/documents/ctestdfrontpages.pdf>

**TEXTBOOKS AND RESOURCE MATERIALS:****Textbooks**

| <b>Board<br/>Approved</b> | <b>Textbook Title<br/>ISBN #</b>                                                                                     | <b>Author(s)</b>                                                           | <b>Publisher</b>    | <b>Edition</b> |
|---------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------|----------------|
| <i>Yes</i>                | <i>Managing our Natural<br/>Resources 5th Edition</i><br><br><i>978-1428318687</i>                                   | William Camp-Betty Heath<br>Camp                                           | Cengage<br>Learning | 5th            |
| <i>Yes</i>                | <i>Principles of<br/>Agriculture, Food and<br/>Natural Resources 2nd<br/>Edition</i><br><br><i>978-1-63776-096-3</i> | John S. Rayfield, Kasee L.<br>Smith, Travis D. Park, and<br>D. Barry Croom | G-W                 | 2nd            |