



**El Camino College**  
**COURSE OUTLINE OF RECORD – Official**

|                                     |                                                                                                                                                                                                                                                                                                                                                                                 |
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| <b>Course Acronym:</b>              | AHSD                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Course Number:</b>               | 522                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Descriptive Title:</b>           | High School Physical Science - Chemistry                                                                                                                                                                                                                                                                                                                                        |
| <b>Division:</b>                    | Adult High School Diploma                                                                                                                                                                                                                                                                                                                                                       |
| <b>Department:</b>                  | Adult High School Diploma                                                                                                                                                                                                                                                                                                                                                       |
| <b>Course Disciplines:</b>          | Adult High School Diploma                                                                                                                                                                                                                                                                                                                                                       |
| <b>Catalog Description:</b>         | <p>This noncredit high school level course introduces students to the study of chemistry, including atomic structure, substances, and reactions. Successful completion of this course contributes to progress toward a high school diploma or equivalent. From 1-10 high school credits can be earned in 15-hour modules.</p> <p>Note: This course is open entry/open exit.</p> |
| <b>Prerequisite:</b>                |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Co-requisite:</b>                |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Recommended Preparation:</b>     |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Enrollment Limitation:</b>       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hours Lecture (per week):</b>    | .83 to 8.33                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hours Laboratory (per week):</b> | 0                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Outside Study Hours:</b>         | 1.66 to 16.66                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Total Course Hours:</b>          | 15 to 150                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Course Units:</b>                | 0                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Grading Method:</b>              | Pass/No Pass/SP                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Credit Status:</b>               | Noncredit                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Transfer CSU:</b>                | No                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Effective Date:</b>              |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Transfer UC:</b>                 | No                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Effective Date:</b>              |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>General Education: ECC</b>       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Term:</b>                        |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Other:</b>                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>CSU GE:</b>                      |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Term:</b>                        |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Other:</b>                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>IGETC:</b>                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Term:</b>                        |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Other:</b>                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Cal-GETC:</b>                    |                                                                                                                                                                                                                                                                                                                                                                                 |

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| <b>Term:</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Other:</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Student Learning Outcomes:</b> | <p>Upon completion of the class, students will be able to:</p> <ol style="list-style-type: none"> <li>1. explain the value of the scientific method.</li> <li>2. diagram interrelationships between chemical components at the subatomic, atomic, and molecular levels.</li> <li>3. construct and balance chemical equations.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Course Objectives:</b>         | <ol style="list-style-type: none"> <li>1. Explain the difference between superstitions and scientific knowledge.</li> <li>2. List the steps of the scientific method.</li> <li>3. Use resources to create a research question and form a hypothesis.</li> <li>4. Create a procedure to prove or disprove a hypothesis.</li> <li>5. Write a conclusion based on observations, data, and results.</li> <li>6. Compare and contrast subatomic atomic particles in terms of characteristics and effects on atomic features.</li> <li>7. Diagram atoms using models of atomic structure.</li> <li>8. List differences between molecular and ionic compounds.</li> <li>9. Integrate elements into proper molecular formulas using ionic charge or valance electrons.</li> <li>10. List components of chemical reactions.</li> <li>11. Demonstrate familiarity with chemical reactions.</li> <li>12. Identify and differentiate between chemical reaction types.</li> <li>13. Identify the metals and non-metals on a periodic table.</li> <li>14. Identify the elements and their proportions in a chemical formula.</li> </ol> |
| <b>Major Topics:</b>              | <p>Note that this is high school level content:</p> <p><b>I. Scientific Method (lecture)</b></p> <p>A. Measurements and Units</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

B. Conversions

**II. Types of Matter (lecture)**

A. Solids, Liquids, and Gases

B. Kinetic Molecular Theory

C. Physical and Chemical Properties and Changes

**III. Atoms (lecture)**

A. Protons, Neutrons, and Electrons

B. Electron Orbitals and Configuration/Atomic  
Diagrams

**IV. Elements and the Periodic Table (lecture)**

A. Elements and Atomic Numbers

B. Noble Gases/Stable Electron Numbers

C. Ions

D. Isotopes and Atomic Mass

**V. Molecules (lecture)**

A. Ionic and Covalent Molecules

B. Writing Ionic Formulas

C. Molecular Mass and Percent Composition

**VI. Reactions (lecture)**

A. Writing and Balancing Reactions

B. Combination/Synthesis

C. Decomposition

D. Single Replacement

E. Double Replacement

F. Combustion

**VII. Metals (lecture)**

A. Minerals and Ores

B. Isolating Metals

**VIII. Suspensions (lecture)**

A. Separating Suspensions

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|                                                                              | <p>B. Colloids</p> <p><b>IX. Solutions (lecture)</b></p> <p>A. Solutes and Solvents</p> <p>B. Separating Solutions</p> <p>C. Concentration</p> <p>D. Solubility</p>                                                                                                                                                                                                                                                                                                                                    |
| <b>Total Lecture Hours:</b>                                                  | 15 to 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Total Laboratory Hours:</b>                                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Total Hours:</b>                                                          | 15 to 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>A.2. Primary Method of Evaluation (Part 2 - all courses; choose one):</b> | 2) Problem solving demonstrations (computational or non-computational)                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Typical Assignment Using Primary Method of Evaluation:</b>                | 1. Select a reaction from each of the categories (combination, decomposition, single replacement, double replacement, and combustion). For each reaction write the reaction with properly represented elements and molecules; balance the equation. For the replacement reactions, determine if they work. In a well-developed paragraph, describe exactly how you decided whether they would work or not.                                                                                             |
| <b>Critical Thinking Assignment 1:</b>                                       | Pick an element from 1-20 on the periodic table. Write a short report on the element that you chose including its atomic number, common isotopes, common ions, an atomic diagram for one of the common isotopes, and three additional facts about the element. You must include two sources, only one of which can be a Wiki source. Use proper MLA format for cited works. We will be anonymously peer reviewing these papers with assigned rubrics, so please put your name only on the cover sheet. |
| <b>Critical Thinking Assignment 2:</b>                                       | Categorize the 15 index cards you have been given as either pure substances or mixtures. Then, classify the pure substances as either an element or compound, and classify the mixtures as homogeneous or heterogeneous. For each category of substances, write 1-2 sentences explaining how you determined your classifications.                                                                                                                                                                      |
| <b>Other Evaluation Methods:</b>                                             | Completion, Homework Problems, Matching Items, Multiple Choice, Objective Exam, Quizzes, Written Homework                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Instructional Methods:</b>                                                | Demonstration, Discussion, Group Activities, Lecture, Multimedia presentations                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>If other:</b>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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| <b>Work Outside of Class:</b>                                                                                                                      | Answer questions, Problem solving activity, Required reading, Study, Written work (such as essay/composition/report/analysis/research) |
| <b>If Other:</b>                                                                                                                                   |                                                                                                                                        |
| <b>Up-To-Date Representative Texts:</b>                                                                                                            | Zumdahl, Steven, Zumdahl, Susan, DeCoste, Donald. <i>Chemistry, (11e)</i> . Cengage, 2023.                                             |
| <b>Alternative Texts:</b>                                                                                                                          |                                                                                                                                        |
| <b>Required Supplementary Readings:</b>                                                                                                            |                                                                                                                                        |
| <b>Other Required Materials:</b>                                                                                                                   |                                                                                                                                        |
| <b>Requisite:</b>                                                                                                                                  |                                                                                                                                        |
| <b>Category:</b>                                                                                                                                   |                                                                                                                                        |
| <b>Requisite course(s): List both prerequisites and corequisites in this box.</b>                                                                  |                                                                                                                                        |
| <b>Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).</b>                     |                                                                                                                                        |
| <b>Requisite Skill:</b>                                                                                                                            |                                                                                                                                        |
| <b>Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable</b>                                                           |                                                                                                                                        |
| <b>Requisite course:</b>                                                                                                                           |                                                                                                                                        |
| <b>Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).</b>                     |                                                                                                                                        |
| <b>Requisite Skill:</b>                                                                                                                            |                                                                                                                                        |
| <b>Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable</b> |                                                                                                                                        |
| <b>Enrollment Limitations and Category:</b>                                                                                                        |                                                                                                                                        |
| <b>Enrollment Limitations Impact:</b>                                                                                                              |                                                                                                                                        |
| <b>Course Created by:</b>                                                                                                                          | Matthew Kline                                                                                                                          |
| <b>Date:</b>                                                                                                                                       | 03/25/2024                                                                                                                             |
| <b>Original Board Approval Date:</b>                                                                                                               | 01/13/2025                                                                                                                             |
| <b>Last Reviewed and/or Revised by:</b>                                                                                                            | Matt Kline                                                                                                                             |
| <b>Date:</b>                                                                                                                                       | 03/11/2026                                                                                                                             |
| <b>Last Board Approval Date:</b>                                                                                                                   | 05/20/2026                                                                                                                             |
| <b>Effective Term:</b>                                                                                                                             | FA 2026                                                                                                                                |