FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

AP Chemistry

Board Approval Date: May 16, 2024	**Course Length: 2 Semesters**
Grading: A-F	**Credits: 5 Credits per Semester**
Proposed Grade Level(s): 11, 12	**Subject Area: Physical Science** **Elective Area (if applicable):**
Prerequisite(s): **IM3 concurrent or completed, Chemistry or Honors Chemistry**	**Corequisite(s):** **N/A**
CTE Sector/Pathway: N/A	
Intent to Pursue 'A-G' College Prep Status: Yes	
A-G Course Identifier: (d) Laboratory Science	
Graduation Requirement: No	
Course Intent: District Course **Program (if applicable): AP**	

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Donald Ogden, Associate Superintendent – Human Resources, Title IX Coordinator (Employees) & Equity Compliance Officer
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COURSE DESCRIPTION:

AP Chemistry is an introductory college-level chemistry course. Students cultivate their understanding of chemistry through inquiry-based lab investigations as they explore the four Big Ideas: scale, proportion, and quantity; structure and properties of substances; transformations; and energy. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore content such as atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Atomic Structure and Properties	What is a mole? What is the relationship between elemental composition by mass and empirical formula of a pure substance and/or mixture? What conclusions can be drawn from a mass spectrum? A photoelectron spectrum? How do Coulomb's law and atomic structure explain trends in atomic radius, electronegativity, and ionization energy?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Hydrate Lab, Mass and Mole Relationships Lab *Other Activities: Mass Spectroscopy POGIL	*Quizzes *Labs *Exams
2. Molecular and Ionic Compound Structure and Properties	What are the different bond types and what physical/chemical properties are observed for each bond type? How can Lewis structures and VSEPR be used to determine molecule polarity, structural properties, and electron properties of covalent molecules?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Mystery Lab, Shrinky Dink Lab	*Quizzes *Labs *Exams
3. Intermolecular Forces and Properties	What is the relationship between the macroscopic properties of a substance, the particulate-level structure of the substance,	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets	*Quizzes *Labs *Exams

	and the interactions between these particles? What is the kinetic molecular theory and what happens when gas behavior deviates from the kinetic molecular theory? What is the relationship between frequency, wavelength, and energy of light? What is the relationship between concentration, absorbance, and transmittance?	*POGILs *Lab(s): Intermolecular Forces Lab, Chromatography Lab, Flame Test Lab	
4. Chemical Reactions	What is the difference between a physical process and chemical reaction? How can we predict products of a chemical reaction and represent the reaction through a net ionic equation? How can we calculate the amount(s) of reactants and/or products used or produced in a chemical reaction? What is the difference between precipitation reactions, acid-base reactions, and oxidation-reduction reactions?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Precipitation Lab, Weak Acid/Strong Base Titration	*Quizzes *Labs *Exams
5. Kinetics	Why are some reactions faster than other reactions? How can data be used to determine rate order and/or rate law? What is the purpose of a catalyst?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Reaction Rate Lab, Sulfur Clock Lab	*Quizzes *Labs *Exams
6. Thermodynamics	How is energy involved in various physical and chemical processes?	*AP Classroom Progress *Checks *Quizzes *Problem Sets	*Quizzes *Labs *Exams

		*Worksheets *POGILs *Lab(s): Endothermic vs. Exothermic Lab, Calorimetry/Standard Enthalpy of Formation Lab	
7. Equilibrium	How can reactions occur in more than one direction? What is chemical equilibrium and what calculations can be done to communicate the amount of reactants and products that exist in a reversible reaction at equilibrium? How can chemical equilibrium of a reversible reaction be changed? What calculations can be done to communicate these changes in equilibrium?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Le Chatelier Lab, Ksp Lab	*Quizzes *Labs *Exams
8. Acids and Bases	How are reactions involving acids and bases related to pH? What is the pH scale and how is this value determined mathematically? What do Ka and Kb represent in acidic and/or basic solutions? What is the purpose of buffers?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Buffer Lab, Magic Pen Lab	*Quizzes *Labs *Exams
9. Applications of Thermodynamics	How is the favorability of a chemical or physical transformation determined? How is electrical energy generated using chemical reactions?	*AP Classroom Progress *Checks *Quizzes *Problem Sets *Worksheets *POGILs *Lab(s): Enthalpy, Entropy, and Gibbs Free Energy Lab, Electrolysis of KI Lab, Tin Man Electrochemistry Lab, Build Your Own Battery Lab	*Quizzes *Labs *Exams

ESSENTIAL STANDARDS:

See essential standards as per College Board AP Chemistry CED:
https://apcentral.collegeboard.org/media/pdf/ap-chemistry-course-and-exam-description.pdf

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.
https://www.cde.ca.gov/be/st/ss/documents/finalelaccssstandards.pdf

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.
https://apcentral.collegeboard.org/media/pdf/ap-chemistry-course-and-exam-description.pdf

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://apcentral.collegeboard.org/media/pdf/ap-chemistry-course-and-exam-description.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://apcentral.collegeboard.org/media/pdf/ap-chemistry-course-and-exam-description.pdf

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
Text will be board approved with approval of this outline.		*Chemistry, The Central Science*	Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfus	Pearson	15th	*1/1/2023*