Plymouth Public Schools' Science and Technology/Engineering Program Advanced Placement Chemistry Course Syllabus

STE0031 Chemistry Advanced Placement
STEL031 AP Chemistry Lab Advanced Placement

Full year course intended for students in grades 11 through 12 worth 5 credits and accompanying one-semester lab course worth additional 2.5 credits

Course Description

This laboratory course is designed for talented students to provide an opportunity equal in rigor to a college-level general chemistry course. Students must have a strong mathematical background to be successful in this course. Emphasis is placed on six big ideas with topics including the fundamental building materials of matter, chemical and physical properties of materials, changes in matter, reaction rates, laws of thermodynamics, and both the formation and breaking of bonds and intermolecular attractions. This course also emphasizes specific science practices outlined for AP Chemistry by the College Board. Please note that students are required to take the Advanced Placement Test. In order to meet the curriculum requirements of the Advanced Placement program, this course will be scheduled for two blocks in one semester and a single block in the other semester. Students should consider this additional time factor when planning their course selections. The prerequisites include successful completion of Chemistry and departmental recommendation.

Instructional Objectives

Students will independently and collaboratively:

1. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to answer a question or solve a problem.
2. Draw evidence from literary or informational texts to support analysis, reflection, and research.
3. Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and audience.
4. Use representations and models to communicate scientific phenomena and solve scientific problems.
5. Use mathematics appropriately.
6. Engage in scientific questioning to extend thinking or to guide investigations within the context of AP Chemistry.
7. Plan and implement data collection strategies appropriate to a particular scientific question.
8. Perform data analysis and evaluation of evidence.
9. Work with scientific explanations and theories.
10. Connect and relate knowledge across various scales, concepts and representations in and across domains.

11. Demonstrate proficiency in physical science concepts including, but not limited to the structure of matter, states of matter, reactions, descriptive chemistry, chemical calculations, and laboratory work.

Themes and Topics

1. Chemical elements are fundamental building materials of matter, and all matter can be understood in terms of arrangements of atoms. These atoms retain their identity in chemical reactions.
2. Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.
3. Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.
4. Rates of chemical reactions are determined by details of the molecular collisions.
5. The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.
6. Any bond or intermolecular attraction that can be formed can be broken. These two processes are in a dynamic competition, sensitive to initial conditions and external perturbations.

Text and Instructional Materials

1. Tro, N. J. (2017). *Chemistry: A Molecular Approach.* Boston: Pearson.
2. Web-based product that accompanies textbook; see teacher for access

Cheating/Plagiarism

The excerpt from the Plymouth Public Schools' Student Handbook on plagiarism and copyright infringement states, "Existing copyright law will govern the use of material accessed through network. The user will not plagiarize works found on the Internet. Plagiarism is taking the ideas or writings of others and presenting them as if they were yours. All copyrighted material used must have the express written permission of the person or organization that owns the copyright. Any student who has cheated on any academic exercise will receive no credit for that exercise. Plagiarism is a form of cheating. A parent/guardian will be notified by the involved teacher in all instances of cheating. The investigation of the claim of cheating and plagiarism will involve the student, teacher, and administration."

Grading Policy and Assessment

Levels of proficiency on various tasks and assignments determine student grades. During each grading term, students' grades will be based upon the following:

20% Homework: notes, notebook work, review packets, etc.

80% Assessments: in-class labs, online assignments, problem sets, quizzes, tests, virtual labs, etc.

The final year average will be calculated as follows:

22.5% Term 1 Grade
22.5% Term 2 Grade
22.5% Term 3 Grade
22.5% Term 4 Grade
10% Final Exam

Please note that a grade of pass or fail will be issued for the AP Chemistry Lab Advanced Placement (STEL031). This will not be included in the student's grade point average. Student performance will be based on Science and Engineering Practices outlined in the Massachusetts' Science and Technology/Engineering Curriculum Framework and College Board.