

College of San Mateo
Course Outline

- New Course
 Update/No change
 Course Revision (Minor)
 Course Revision (Major)

Date: 11/10/11

Department: CHEMISTRY **Number: 410**

Course Title: Health Science Chemistry I **Units: 4**

Total Semester Hours **Lecture: 48** **Lab: 48** **Homework: 80** **By Arrangement: 16**

Length of Course

- Semester-long
 Short course (Number of weeks _____)
 Open entry/Open exit

Grading

- Letter
 Pass/No Pass
 Grade Option (letter or Pass/No Pass)

Faculty Load Credit (To be completed by Division Office; show calculations.):

48 lecture hours X 1 FLC / 16 hours Lecture = 3.0 FLC

48 lab hours X 0.8 FLC / 16 hours Lab = 2.4 FLC

5.4 FLC Per Semester

1. Prerequisite (Attach Enrollment Limitation Validation Form.)

MATH 110 or equivalent with a grade of C or higher, or appropriate score on the College Placement test.

2. Corequisite (Attach Enrollment Limitation Validation Form.)

NONE

3. Recommended Preparation (Attach Enrollment Validation Form.)

Eligibility for ENGL 838/ 848.

4. Catalog Description (Include prerequisites/corequisites/recommended preparation. For format, please see model course outline.)

CHEM 410 Health Science Chemistry I (4) Minimum of 48 lecture hours and 48 lab hours plus 16 hours by arrangement per term. Prerequisite: MATH 110 or equivalent with a grade of C or higher, or appropriate score on the College Placement test. Recommended Preparation: eligibility for ENGL 838/848. Introduction to chemistry for the health sciences, beginning with scientific measurement and the metric system, followed by chemical bonding, solution chemistry, acids and bases, redox reactions, gases and general aspects of stoichiometry. Extra supplies may be required. Students who complete CHEM 210-220 and CHEM 410-420 will receive credit for CHEM 210-220 only. (AA: Area E5a, CSU: Area B1& B3)

5. **Class Schedule Description** (Include prerequisites/corequisites/recommended preparation. For format, please see model course outline.)

Same as above.

6. **Student Learning Outcomes** (Identify 1-6 expected learner outcomes using active verbs.)

Upon successful completion of the course, the student will be able to:

1. At the introductory level, students will become familiar with the nanoscale particle nature of matter including atoms, molecules and ions and the various states they exist in.
2. Students will be able to represent the chemical elements and simple chemical compounds, and they will begin the process of depicting a variety of chemical reactions involving elements, compounds and ions.
3. Students will solve elementary quantitative problems involving concentrations, behavior and reactions of various chemical substances. Special emphasis will often be given to examples that directly relate to the human body.

7. **Course Objectives** (Identify specific teaching objectives detailing course content and activities. For some courses, the course objectives will be the same as the student learning outcomes. In this case, "Same as Student Learning Outcomes" is appropriate here.)

SAME AS STUDENT LEARNING OUTCOMES

8. **Course Content** (Brief but complete topical outline of the course that includes major subject areas [1-2 pages]. Should reflect all course objectives listed above. In addition, a sample course syllabus with timeline may be attached.)

(Please see attached syllabus for course timeline)

- Introduction to scientific methodology, scientific notation, metric units, errors, significant figures and dimensional analysis.
- Presentation of basic chemical concepts, properties, chemical and physical changes, pure substances and mixtures.
- Concepts of heat, temperature and energy.
- Introduction to atomic theory. The student will understand modern atomic theory with regard to the major subatomic particles. Basic properties of atoms, ions, and isotopes will be presented.
- Chemical bonding and resulting chemical structures will be studied. Types of bonds with their properties will be discussed.
- Gas laws and calculations using these laws will be understood.
- Solution chemistry will be presented.
- Chemical equilibrium.
- Acid and base chemistry with a special emphasis upon buffers will be explored. Buffer chemistry will be highlighted due to its critical nature in the human body.

9. **Representative Instructional Methods** (Describe instructor-initiated teaching strategies that will assist students in meeting course objectives. Describe out-of-class assignments, required reading and writing assignments, and methods for teaching critical thinking skills. **If hours by arrangement are required, please indicate the additional instructional activity which will be provided during these hours, where the activity will take place, and how the activity will be supervised.**)

Some but not necessarily all of the following methods are employed when teaching this course to assist students in achieving the course objectives.

- Students will be required to have an appropriate textbook and approved laboratory manual for this course.
- Lecture style presentation of materials
- Computer and video programs.
- In class exams and a comprehensive final
- Group work on problems in lecture and experimental procedures in lab.
- The use of assigned homework.
- In class presentation of a topic that fits in the domain of modern science.
- Instructional materials that will be integrated in this class will include a textbook, outside electronic media (such as videos of chemistry related movies), three dimensional computer simulations of chemical compounds, and physical model kits.
- To be arranged hours will be required. Students are expected to work on the practice and use of modern chemistry as it relates to everyday life. These activities are above and beyond normal classroom/laboratory instruction and are in excess of prescribed homework activities. A list of approved TBA will be provided to students at the start of the semester.

10. Representative Methods of Evaluation (Describe measurement of student progress toward course objectives. Courses with required writing component and/or problem-solving emphasis must reflect critical thinking component. If skills class, then applied skills.)

Some but not necessarily all of the following methods are employed when teaching this course to assist the students in achieving the course objectives.

Exams, quizzes, laboratory work, written and oral reports, and assigned exercises will be used to learn and evaluate in an on-going manner students' knowledge acquisition. Furthermore, students may be required to give a class presentation of a modern topic in the sciences.

11. Representative Text Materials (With few exceptions, texts need to be current. Include publication dates.)

(2009) Karen Timberlake, *General, Organic, and Biological Chemistry 3rd. ed*
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