# Institutional Syllabus

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<th>Substantive Change in Existing Course</th>
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## I. Course Title
Introductory Chemistry

## II. Course Prefix/Number
CHEM 111

## III. Credit Hours
4

## IV. Prerequisites
Math ACT score of 19 OR Math SAT score of 440 OR ACCUPLACER Math score of 85 OR MATH 099 minimum grade S.

## V. Catalog Description
A study of the fundamental concepts of chemistry. The course is satisfactory for pre-nursing students and for biology majors who take only one year of chemistry. It will not satisfy the requirements for a chemistry major or minor. It is not suitable for the preprofessional programs such as pre-med, pre-dental, pre-vet, or medical technology. Four lectures per week.

## VI. Curricular Relationships
This course fulfills general education science credits. It may be used for the BA in Biology, the BS in Biology (Wildlife emphasis), the BA in Exercise Physiology and Leisure Science, pre-nursing, pre-physical therapy, and for the minor in General Science.

## VII. Student Learning Outcomes

- Students will demonstrate an ability to solve problems, think critically, and draw analogies.
- Students demonstrate an ability to write effectively, particularly with respect to technical subjects.
- Students will be able to classify matter, recognize changes in matter and understand the current model of the atom (at a level commensurate with the level of this course).
- Students will be able to distinguish between types of bonding and predict properties, structures, and names of molecules/compounds that are formed from these types of bonds.
- Students will be able to balance equations, classify types of reactions and predict products from simple reactions.
• Students will be able to solve quantitative problems involving unit conversions, heat changes, molar quantities, stoichiometry, solution concentrations, gas laws, pH, and others.
• Students will recognize the importance of intermolecular attractive forces to physical properties of matter and to the solution process.
• Students will be able to describe the thermodynamics and kinetics of simple reactions and chemical equilibrium at a level appropriate for this course.
• Students will be able to describe the chemical properties and behaviors of acids, bases, and buffers.
• Students will be able to describe the basic process of radioactivity and its uses.

VIII. Content Outline
1. Matter and Chemistry
2. The scientific method
3. Measurements
4. Atomic theory
5. Chemical bonding
6. Nomenclature
7. Molecular shapes and polarity
8. Introduction to chemical reactions and balancing equations
9. Stoichiometry
10. Reduction-oxidation reactions
11. Intermolecular forces, phases of matter, and gases
12. Solutions
13. Kinetics
14. Equilibrium
15. Acids, bases, and buffers
16. Nuclear chemistry

IX. Course Procedures/Policies/Grading Scale

Students are expected to attend all lecture sessions. Homework is assigned and graded. On average, bluebook quizzes are given at the start of class twice a week. Typically, four or five hour exams and a comprehensive final exam (standardized ACS examination in introductory chemistry) are given in this course.

Normal grading is used for this course.

Grading Scale: >90 = A; 80-89 = B; 70-79 = C; 60-69 = D; <60 = F

X. Required/Recommended Readings

A typical text for this course is *Introductory Chemistry, 2nd Edition*, by Russo and Silver

XI. Issues Unique to this Course

Corequisite of CHEM 111L, unless the student already has earned a grade of C or better in that laboratory from a previous semester
XII. Additional Departmental Issues

None