

**CHEM 111 Introduction to General Chemistry****Credit Hours:** 4**Scheduled hours per week**

Lecture: 3

Lab: 2

Other: N/A

**Catalog Course Description:** Elementary introduction to concepts of chemistry including metric measurement, periodic properties, atomic and molecular structure, bonding, formulas and nomenclature, redox chemistry, stoichiometry, states of matter and gas laws, solutions, equilibria, and acid-base chemistry. Designed for students with no background in chemistry. Co-requisite laboratory coordinates exercises with lecture topics. (3 lecture hours and 2 lab hours per week)

**Pre-requisites:****Co-requisites:** CHEM 111L**Course Learning Outcomes:**

- Use metric system and measurements in quantifying distance, mass, and volume to meet required accuracy
- Implement safety rules and concepts in the chemical laboratory environment
- Execute safety when operating laboratory equipment, instruments, and procedures
- Execute written procedures to set up and conduct experiments, write observations, make judgments, and perform required calculations
- Illustrate basic mathematics and simple algebra skills. Use calculator, computer, and linear slope extrapolation to solve chemical related math problems
- Carry out the principles of building elements, periodic table, simple molecules, and prediction of chemical properties
- Explain the solution properties including molecular polarity, solubility, concentrations, the colligative properties and chemical reactions
- Explain acid and base reactions, quantitative titration, buffer solution, and pH measurements
- Distinguish stoichiometry and equilibrium phenomena in various kinds of chemical reactions
- Employ calculations for a gas system including using Boyle's and Charles's Laws

**Topics to be studied:**

- Basic math operations
- The metric system and unit factor conversions

**Relationship of Course to Program or Discipline Learning Outcomes:**

| <b>Relationship of Course to Science Learning Outcomes:</b>  |   |
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| Students will learn the process and reasoning behind the Scientific Method and be able to conduct experiments that meet the requirements of the model. | X |
| Students exhibit the basic safety-related rules and regulations of working in the lab.   | X |

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| Students be able to recount the basic safety tenants associated with a specific scientific discipline.          | X |
| Students will become proficient at Science Writing.   | X |
| Students will recognize and identify the applications of their specific discipline in the 'real world.'         | X |
| Students will accurately recount important milestones in the history of scientific inquiry in their discipline. | X |
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| <b>Relationship of Course to General Education Learning Outcomes:</b>   |   |
| <b>Composition and Rhetoric</b> Students illustrate a fundamental understanding of the best practices of communicating in English and meet the writing standards of their college or program-based communication requirements.                |   |
| <b>Science &amp; Technology</b> Students successfully apply systematic methods of analysis to the natural and physical world, understand scientific knowledge as empirical, and refer to data as a basis for conclusions.                     | X |
| <b>Mathematics &amp; Quantitative Skills</b> Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.  | X |
| <b>Society, Diversity, &amp; Connections</b> Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.                                       |   |
| <b>Human Inquiry &amp; the Past</b><br>Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills. |   |
| <b>The Arts &amp; Creativity</b><br>Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.   |   |
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**Special requirements of the course:**

**Additional information:**

**Prepared by:**

**Date:** 10/30/2017