CHEM 115 Fundamentals of Chemistry 1  
Credit Hours:  4  
Scheduled hours per week  
  Lecture: 3  
  Lab: 2  
  Other: N/A  

Catalog Course Description: Terminology and quantitative relationships; atomic structure, periodic law, chemical bonding, states of matter, and solutions. (3 lecture hours; 2 lab hours per week)  

Pre-requisites: N/A  
Co-requisites: CHEM 115L  

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 in operating laboratory equipment, instruments, and procedures  
- Execute written procedures to set up and conduct experiments, write observations, make judgements, 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  
- 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:  
- Introduction: Matter and Measurement  
- Atoms, Molecules, and Ions  
- Stoichiometry: Calculations with Chemical Formulas and Equations  
- Reactions in Aqueous Solutions  
- Thermochemistry  
- Electronic Structure of Atoms  
- Periodic Properties of the Elements  
- Basic concepts of Chemical Bonding  
- Molecular Geometry and Bonding Theories  
- Gases  

Relationship of Course to Program or Discipline Learning Outcomes:  

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<thead>
<tr>
<th>Relationship of Course to Science Learning Outcomes:</th>
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</table>
| 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  

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Students exhibit the basic safety-related rules and regulations of working in the lab.  
Students be able to recount the basic safety tenants associated with a specific scientific discipline.  
Students will become proficient at Science Writing.  
Students will recognize and identify the applications of their specific discipline in the ‘real world.’  
Students will accurately recount important milestones in the history of scientific inquiry in their discipline.  

**Relationship of Course to General Education Learning Outcomes:**

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<thead>
<tr>
<th>Learning Outcome</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Composition and Rhetoric</strong></td>
<td>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.</td>
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<tr>
<td><strong>Science &amp; Technology</strong></td>
<td>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.</td>
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<tr>
<td><strong>Mathematics &amp; Quantitative Skills</strong></td>
<td>Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.</td>
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<tr>
<td><strong>Society, Diversity, &amp; Connections</strong></td>
<td>Students demonstrate understanding of and a logical ability to successfully analyze human behavior, societal and political organization, or communication.</td>
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<tr>
<td><strong>Human Inquiry &amp; the Past</strong></td>
<td>Students interpret historical events or philosophical perspectives by identifying patterns, applying analytical reasoning, employing methods of critical inquiry, or expanding problem-solving skills.</td>
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<tr>
<td><strong>The Arts &amp; Creativity</strong></td>
<td>Students successfully articulate and apply methods and principles of critical and creative inquiry to the production or analysis of works of art.</td>
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</table>

10/30/2017

**Special requirements of the course:**

**Additional information:**

**Prepared by:**

**Date:** 10/30/2017

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