CHEM 116 Fundamentals of Chemistry 2
Credit Hours: 4
Scheduled hours per week
  Lecture: 3
  Lab: 2
  Other: #

Catalog Course Description: Continuation of CHEM 115. Chemical equilibrium, Ionic equilibrium, electrochemistry, and organic chemistry. (3 lecture hours; 2 lab hours per week) (Pre-requisite: CHEM 115)

Pre-requisites: CHEM 115/115L

Co-requisites: CHEM 116L

Course Learning Outcomes:
- 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 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)
- Broaden knowledge in determine trends in chemical properties and physical properties in both metal and non-metal chemistry
- Determine chemical solution properties including solubility, equilibrium, concentration, acid-base reactions, and electrochemistry
- Be able to identify the difference between chemical thermodynamics and kinetics
- Appreciate modern materials, organic chemistry, environmental chemistry and nuclear chemistry

Topics to be studied:
- Liquids and intermolecular forces
- Solids and modern materials
- Properties of solutions
- Chemical kinetics
- Chemical equilibrium
- Acid-base equilibria
- Additional aspects of aqueous equilibria
- Chemistry of the environment
- Chemical thermodynamics
- Electrochemistry
- Nuclear chemistry
- Chemistry of nonmetals

Relationship of Course to Program or Discipline Learning Outcomes:

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

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

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<thead>
<tr>
<th>Learning Outcomes</th>
<th>Description</th>
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<tbody>
<tr>
<td>Composition and Rhetoric</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>Science &amp; Technology</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>Mathematics &amp; Quantitative Skills</td>
<td>Students effectively use quantitative techniques and the practical application of numerical, symbolic, or spatial concepts.</td>
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<td>Society, Diversity, &amp; Connections</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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<td>Human Inquiry &amp; the Past</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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<td>The Arts &amp; Creativity</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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### Special requirements of the course:

### Additional information:

Prepared by:  
Date: 10/30/2017