Chemistry - Enhanced

SCI1105

Course Description
Chemistry is the investigation of atomic and molecular-level properties and interactions. The course begins with properties of matter, atomic structure, and basic atomic bonding. It then lays a mathematical and conceptual groundwork for which more complex molecular interactions can be understood. This course will provide students with a number of analytical tools needed for scientific investigation and thought. The student will apply these principals in an online virtual lab where lab experiments are simulated in a way that is virtually equivalent to the engagement in a classroom laboratory.

Rationale
Chemistry allows the students an opportunity to explore substances, their properties, and how the interactions of these substances can generate a different set of properties. The study of Chemistry generates critical cognition and analysis that enlightens the student's perception on the function of substances within Creation. Chemistry is a necessary component of the student’s understanding of physical processes in the world around them.

Prerequisite
Completion or current enrollment in Algebra II

Measurable Learning Outcomes
A. The student will investigate and understand that experiments in which variables are measured, analyzed, and evaluated produce observations and verifiable data.
B. The student will investigate and understand that the placement of elements on the periodic table is a function of their atomic structure.
C. The student will investigate and understand how conservation of energy and matter is expressed in chemical formulas and balanced equations.
D. The student will investigate and understand that chemical quantities are based on molar relationships.
E. The student will investigate and understand that the phases of matter are explained by kinetic theory and forces of attraction between particles.
F. The student will investigate and understand how basic chemical properties relate to organic chemistry and biochemistry.
Enhanced Courses
LUOA Enhanced Courses provide additional student support through increased interaction and communication with the course instructor. Interaction takes place through:

- Weekly live teaching sessions
- Q&A conference with teacher before each test
- Discussion boards

Participation Grade
Students are given a participation grade based on attendance during the teacher live sessions and participation in discussion boards. For full year courses, there are 20 teacher live sessions and four discussion boards. Semester courses have 10 live sessions and two discussion boards. Participation grades are given at the end of each semester and count as a Tier 3 assignment.

Semester Grade Participation:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Attended 8-10 teacher live sessions, participated in two discussion boards</td>
</tr>
<tr>
<td>B</td>
<td>Attended 6-7 teacher live sessions, participated in two discussion boards</td>
</tr>
<tr>
<td>C</td>
<td>Attended 5 teacher live sessions, participated in two discussion boards</td>
</tr>
<tr>
<td>D</td>
<td>Attended 3-4 teacher live sessions, participated in one discussion board</td>
</tr>
<tr>
<td>F</td>
<td>Attended 0-3 live teacher sessions, participated in zero discussion boards</td>
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</tbody>
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Semester and Final Exams Proctored
The proctoring of the semester and/or final exam by a parent/guardian or other adult is required for Enhanced Courses. A form is provided in the course that the proctor will sign and complete. The student will then upload the form into an assignment before being able to begin the exam.

Course Materials
See LUOA’s Systems Requirements for computer specifications necessary to operate LUOA curriculum. Also view Digital Literacy Requirements for LUOA’s expectation of users’ digital literacy.

This course makes use of third-party digital resources to enhance the learning experience. These resources have been curated by LUOA staff and faculty and can be safely accessed by students to complete coursework. Please ensure that internet browser settings, pop-up blockers, and other filtering tools allow for these resources to be accessed.

The following resource(s) are used throughout this course:

- Late Nite Labs

Note: Embedded YouTube videos may be utilized to supplement LUOA curriculum. YouTube videos are the property of the respective content creator, licensed to YouTube for distribution.
and user access. As a non-profit education institution, LUOA is able to use YouTube video content under the YouTube Terms of Service and the provisions of the TEACH Act of 2001. For additional information on copyright, please contact the Jerry Falwell Library.

Course Grading Policies

The students’ grades will be determined according to the following grading scale and assignment weights. The final letter grade for the course is determined by a 10-point scale. Assignments are weighted according to a tier system, which can be referenced on the Grades Page in Canvas. Each tier is weighted according to the table below. Items that do not affect the student’s grade are found in Tier 0.

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Assignment Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, 90-100%</td>
<td>Tier 0 0%</td>
</tr>
<tr>
<td>B, 80-89%</td>
<td>Tier 1 25%</td>
</tr>
<tr>
<td>C, 70-79%</td>
<td>Tier 2 35%</td>
</tr>
<tr>
<td>D, 60-69%</td>
<td>Tier 3 40%</td>
</tr>
<tr>
<td>F, 0-59%</td>
<td></td>
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</table>

Course Policies

Students are accountable for all information in the Student Handbook. Below are a few policies that have been highlighted from the Student Handbook.

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the title, “1.2.3 Quiz: The American Revolution.” These identifiers were placed on the Modules page to help students understand which Honor Code and Resubmission policies apply to that assessment (see the Honor Code and Resubmission policies on the pages to follow for further details).

- **Lesson:** Any item on the Modules page designated as a “Lesson”
  These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.

- **Assignment:** Any item on the Modules page designated as an “Assignment”
  Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do their best work on the first time.

- **Quiz:** Any item on the Modules page designated as a “Quiz”
  This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.
• **Test**: Any item on the Modules page designated as a “Test”  
  This usually takes the form of a traditional assessment where the student will answer 
  questions to demonstrate knowledge of the subject. Tests cover a larger amount of 
  material than Quizzes.

**Resubmission Policy**

Students are expected to submit their best work on the first submission for every Lesson, 
Assignment, Quiz, and Test. However, resubmissions may be permitted in the following 
circumstances:

- **Lesson**: Students are automatically permitted two attempts on a Lesson. The student 
  may freely resubmit for their first two attempts without the need for teacher approval.

- **Assignment**: Students are intended to do their best work the first time on all 
  Assignments. However, any resubmissions must be completed before the student 
  moves more than one module ahead of that Assignment. For example, a student may 
  resubmit an Assignment from Module 3 while in Module 4, but not an Assignment from 
  Modules 1 or 2. High School students may not resubmit an Assignment without 
  expressed written permission from the teacher in a comment.

- **Quiz**: Students may NOT resubmit for an increased grade.

- **Test**: Students may NOT resubmit for an increased grade.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or 
Test due to a technical issue such as computer malfunctioning, the student should message his 
or her teacher to make the request, and that request will need to be approved by a Department 
Chair.

**Consequences for Violations to the Honor Code**

Every time a student violates the Honor Code, the teacher will submit an Honor Code Incident 
Report. The Student Support Coordinator will review the incident and allocate the appropriate 
consequences. Consequences, which are determined by the number of student offences, are 
outlined below:

- **Warning**: This ONLY applies to high school Lessons and elementary/middle school 
  Assignments and Lessons. These will be taken as a teaching moment for the student.
  - **Lessons**: A zero will be assigned for the question only.
  - **Elementary/Middle School Assignment**: The student must redo their work. 
    However, they may retain their original grade.

- **1st Offense**: 
  - **Lesson, Quiz, or Test**: The student will receive a zero on the entire assessment.
- **Assignment**: The student will either:
  - Receive a 0% on the original assignment
  - Complete the Plagiarism Workshop
  - Retry the assignment for a max grade of 80%

- **2nd Offense**: The student will receive a zero and be placed on Academic Probation.

- **3rd Offense**: The student will receive a zero and the Faculty Chair will determine the consequences that should follow, possibly including withdrawal from the course or expulsion from the academy.
Scope and Sequence
Chemistry

Module 1: Tools for Chemistry
Week 1: Accuracy vs. Precision
Week 2: Measurement
Week 3: Representing Data
Week 4: Module 1 Test

Module 2: Matter
Week 5: Matter & Density
Week 6: Module 2 Test

Module 3: Atomic Theory
Week 7: Atomic Theory & the Periodic Table
Week 8: Electron Configurations

Module 4: Chemical Bonding
Week 9: Ionic Bonding
Week 10: Covalent Bonding
Week 11: Module 4 Test

Module 5: Structure & Bonding
Week 12: Topics in Molecular Structure
Week 13: Organic Chemistry
Week 14: Module 5 Test

Module 6: Chemical Reactions
Week 15: Chemical Equations
Week 16: Types of Chemical Reactions
Week 17: Module 6 Test

Module 7: Review & Semester Exam
Week 18: Semester Exam

Module 8: Moles & Stoichiometry
Week 19: Moles & Molar Mass
Week 20: Empirical & Molecular Formulas
Week 21: Stoichiometry, Part I
Week 22: Stoichiometry, Part II

Module 9: States of Matter & Related Laws and Topics
Week 23: Molecules in Action
Week 24: Phase Chemistry

Module 10: The Gas Laws
Week 25: Charles’ & Boyle’s Laws
Week 26: Gay-Lussac & Avogadro’s Laws
Week 27: Module 10 Test

Module 11: Solution Chemistry
Week 28: Solution Chemistry
Week 29: Module 11 Test

Module 12: Acids & Bases
Week 30: Introduction to Acids & Bases
Week 31: Acid, Base, & Redox Reactions
Week 32: Module 12 Test

Module 13: Nuclear Chemistry
Week 33: Radioactivity
Week 34: Nuclear Chemistry
Week 35: Module 13 Test

Module 14: Review & Final Exam
Week 36: Final Exam