

## IL course #: U1905-101 General Chemistry With Lab

**Course Format:** Online

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**Course credits:** 4

**Prerequisites:** College Algebra or concurrent enrollment, or Introductory Chemistry

### Course Description

Introduces fundamental principles of chemistry including atomic theory, periodic properties, energy, stoichiometry, nomenclature, bonding, Lewis structures, and aqueous solution chemistry. Includes first-semester general chemistry laboratory where students explore atomic and molecular properties, classification schemes for chemical reactions, and aqueous solution chemistry.

### Required Course Materials

- Zumdahl, Steven S., et al. *Chemistry*. 10th ed., Cengage Learning, 2018. ISBN-10: 1305957407 | ISBN-13: 9781305957404
- OWL (v2) Homework Platform (Included in the ISBN above.)
- Labster Online Lab Simulations  
Please email your instructor to get access to Labster. Afterward, you will receive an email from Labster with instructions to create your account. After you create your account you must purchase full access to Labster for a one-time fee of \$70.00.

### Optional/Recommended Course Materials

- none

### Hardware Requirements

You will need a webcam, speakers, and a microphone. You will complete your exams through an online proctor, requiring all three components.

The Labster simulations must be run on a Chrome or Firefox browser. Labster simulations currently do not run on mobile devices and may not be accessible from some Chromebooks.

### Course Learning Objectives

After completing this course, the student will be able to:

- Comprehend, summarize or paraphrase fundamental principles of chemistry including atomic theory, periodic properties, energy, stoichiometry, nomenclature, Lewis structures, bonding models, ideal gases, and aqueous solutions.
- Calculate introductory physical and chemical properties for chemicals and chemical systems, stoichiometric measures of chemical systems, and energy relationships in simple chemical systems.
- Describe the general shape and structure of atoms and molecules using current theories.
- Approach problems using multiple approaches and apply prior knowledge to new situations/problems.
- Identify and follow safety procedures in the laboratory.

- Recognize and properly handle laboratory glassware and other laboratory equipment.
- Meticulously record qualitative observations and think critically about possible sources of error.
- Draw reasonable conclusions from experimental data.

## Course Overview

MODULE/U NIT #	MODULE/UNIT TOPIC	EVALUATED ACTIVITIES
1	Introduction, Syllabus, and Lab Safety + Lab 1	<ul style="list-style-type: none"> <li>• Syllabus quiz (Canvas)</li> <li>• Lab 1 - Lab Safety (Labster)</li> <li>• Lab 1 report quiz (Canvas)</li> </ul>
2	Measurements, Significant Digits, and Dimensional Analysis + Lab 2	<ul style="list-style-type: none"> <li>• Chapter 1 homework (OWL)</li> <li>• Lab 2 - Solution Preparation (Labster)</li> <li>• Lab 2 report quiz (Canvas)</li> </ul>
3	Atoms, Molecules, Ions, the Mole, and Nomenclature + Lab 3	<ul style="list-style-type: none"> <li>• Chapter 2 homework (OWL)</li> <li>• Lab 3 - Atomic Structure (Labster)</li> <li>• Lab 3 report quiz (Canvas)</li> </ul>
4	Stoichiometry + Lab 4	<ul style="list-style-type: none"> <li>• Chapter 3 homework (OWL)</li> <li>• Lab 3 - Stoichiometry: Gravimetric Analysis (Labster)</li> <li>• Lab 3 report quiz (Canvas)</li> </ul>
5	Exam 1 (Chapters 1 – 3)	<ul style="list-style-type: none"> <li>• Exam 1 (Canvas)</li> </ul>
6	Chemical Reactions and Aqueous Solutions + Lab 5	<ul style="list-style-type: none"> <li>• Chapter 4 homework (OWL)</li> <li>• Lab 5 - Titrations: Neutralize an Acid Lake Contamination (Labster)</li> <li>• Lab 5 report quiz (Canvas)</li> </ul>
7	Gases + Lab 6	<ul style="list-style-type: none"> <li>• Chapter 5 homework (OWL)</li> <li>• Lab 6 - Ideal Gas Law: Save a Life (Labster)</li> <li>• Lab 6 report quiz (Canvas)</li> </ul>
8	Thermochemistry + Lab 7	<ul style="list-style-type: none"> <li>• Chapter 6 homework (OWL)</li> <li>• Lab 7 - Calorimetry: Using a Bomb Calorimeter (Labster)</li> <li>• Lab 7 report quiz (Canvas)</li> </ul>
9	Exam 2 (Chapters 4 - 6)	<ul style="list-style-type: none"> <li>• Exam 2 (Canvas)</li> </ul>
10	Atomic Structure, Quantum Numbers, and Electron Configurations + Lab 8	<ul style="list-style-type: none"> <li>• Chapter 7 homework (OWL)</li> <li>• Lab 8 - Thin Layer Chromatography: Separate a Mixture and Monitor the Progress of a Reaction (Labster)</li> <li>• Lab 8 report quiz (Canvas)</li> </ul>
11	Bonding - Lewis Dot Structures, Valence Shell Electron Pair Repulsion (VSEPR) Theory, and Molecular Polarity + Lab 9	<ul style="list-style-type: none"> <li>• Chapter 8 homework (OWL)</li> <li>• Lab 9 - Solution Preparation (Labster)</li> <li>• Lab 9 report quiz (Canvas)</li> </ul>

12	Bonding - Valence Bond Theory and Molecular Orbital Theory + Lab 10	<ul style="list-style-type: none"> <li>• Chapter 9 homework (OWL)</li> <li>• Lab 10 - Solution Preparation (Labster)</li> <li>• Lab 10 report quiz (Canvas)</li> </ul>
13	Exam 3 (Chapters 7 - 9)	<ul style="list-style-type: none"> <li>• Exam 3 (Canvas)</li> </ul>
14	Final Exam (Chapters 1 - 9)	<ul style="list-style-type: none"> <li>• Final Exam (Canvas)</li> </ul>

## Evaluation Methods

- 1) Your final grade will be based on your performance on the following:
- 2) Chapter Homework and Syllabus Quiz (20%)
- 3) Labster Simulations (10%)
- 4) Lab Report Quizzes (20%)
- 5) Unit Exams (30%)
- 6) Final Exam (20%)

### Chapter Homework and Syllabus Quiz (20%)

Chapter homework will be completed on the OWL (v2) homework platform and will consist of both practice problems and an assessment quiz designed to help you track your progress with the material. The key to doing well in a course like chemistry is practice so this homework is designed to help you reach mastery with the material. You will have multiple attempts for each homework problem and will receive instant feedback when you submit your answers. The syllabus quiz is to ensure that we are on the same page with the course structure and breakdown (Hint: Argon). Cumulatively the homework and syllabus quiz will account for 20% of your final course grade.

### Labster Simulations (10%)

In addition to the chapter reading and homework, you will be required to complete a total of 10 online, lab simulations during this course. These simulations satisfy the laboratory portion of this course. These simulations are designed to be more hands-on, and you will be asked to carry out the experiments, record your observations and collect data. Your Labster simulation grades are based on completion. In order to achieve full credit, you will need to complete a minimum of 80% of each lab simulation.

### Lab Reports (20%)

After completing each Labster simulation, return to Canvas to complete the lab report quiz for the lab (one per chapter module). Except for the Lab Safety simulation, each lab report quiz consists of 5 - 8 multiple-choice concept-based questions and short-form response purpose, results, and discussion. The Lab Safety simulation report quiz will consist of only multiple-choice concept-based questions. These lab reports will cumulatively account for 20% of your final grade. **Please note that this is an integral part of the class and you cannot receive a passing grade for the course if you are either missing or fail 3 or more lab report quizzes.**

### Unit Exams (30%)

Unit exams will cover three chapters worth of material and should be taken after the corresponding unit modules have been completed. Each exam will be taken online using a proctoring service (see below for more details). The exams will consist of 15-20 multiple-choice, true/false, and/or fill-in-the-blank type problems. The exams are open-note and a periodic table will be provided. Students will need a scientific calculator and may use scratch paper for calculations. Cumulatively the unit exams will account for 30% of your final grade.

### Final Exam (25%)

The final exam should be taken once all previous units, Labster simulations, and exams have been completed. The final will cover material from all 9 chapters. The exam will consist of 30-35 multiple-choice, true/false, and/or fill-in-the-blank type problems. The final will be similar to the previous unit exams in structure and material. The final exam is open-note and a periodic table will be provided. Students will need a scientific calculator. The final exam is

assigned at the very end of the course and will account for 25% of your final grade. **You must take the final to pass the class.**

### Exam Method: Online with Proctoring

This course requires all students to complete exams online with Proctorio proctoring service. Students receive one attempt on each exam.

Online exam proctoring policies can be found on our Web site:

- Proctoring information: <https://il.wisconsin.edu/current-students/taking-exams/>

If you have questions about examination procedures, contact Student Services at [il@uwex.edu](mailto:il@uwex.edu).

### Grading Scale

The following grading scale is used to evaluate all course requirements and determine your final grade:

A = 93–100	B = 83–87.9	C = 70–77.9	D = 60–69.9
AB = 88–92.9	BC = 78–82.9		F = Below 60

### Pass/Fail Option

Students who enroll in an Independent Learning (IL) course under the pass/fail option will receive a final grade of S in place of a final grade equivalent to an A, AB, B, BC, or C and a final grade of U in place of a final grade equivalent to a D or F.