This course supports the assessment for TUP1. The course covers 1 competency and represents 1 competency unit.

**Introduction**

**Overview**
Chemistry is the study of matter. Everything you see and many of the things you don’t see are made up of atoms. By understanding these atoms and their interactions, chemists have been able to cure disease, travel to the moon, and feed a growing world. By understanding chemistry, you will find your own world expanded. You will find boiling water interesting and the back of the shampoo bottle fascinating.

The National Science Teachers Association (NSTA) has published principles and standards addressing important chemistry topics that should be covered through the K–12 curriculum. Many states have followed the NSTA's lead and are increasingly requiring that these concepts be taught to the students throughout the course of their science education. A firm grasp of the concepts covered in this course will allow you to confidently teach this material when you enter the classroom.

This is the second term of a two-term sequence in chemistry. This course is designed to build on the concepts mastered in General Chemistry I and lab techniques. To master these topics, you will utilize online learning resources and a physical lab kit.

**Getting Started**

This course is the laboratory application of content learned during your General Chemistry II course. You will be applying concepts, techniques, and mathematical calculations to demonstrate competency through the submission of seven lab report assistants and one reflective essay (one performance assessment). The lab kit from Carolina Biologicals, which you will use to complete the activities, contains most of the reagents needed for the experiments.

General Chemistry II and General Chemistry II Laboratory should be completed together. Complete all seven labs listed in the pacing guide while you are working through and learning the material in General Chemistry II. What you learn in the lab course is essential to prepare for the objective assessment for General Chemistry II.

**Competencies**
This course provides guidance to help you demonstrate the following 1 competency:

- **Competency 217.1.10: Analyzing Chemical Processes in Laboratory Experiments**
  The graduate applies effective laboratory techniques to analyze chemical processes in real-world contexts.

**Teaching Dispositions Statement**
Please review the [Statement of Teaching Dispositions](#).
Course Instructor Assistance
As you prepare to demonstrate competency in this subject, remember that course instructors stand ready to help you reach your educational goals. As subject matter experts, mentors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course instructors are excited to hear from you and eager to work with you.

Successful students report that working with a course instructor is the key to their success. Course instructors are able to share tips on approaches, tools, and skills that can help you apply the content you're studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don't work out on your first try, course instructors act as a support system to guide you through the revision process. You should expect to work with course instructors for the duration of your coursework, and you are encouraged to contact them as soon as you begin. Course instructors are fully committed to your success!

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.

Learning Resources
The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

Manually Enrolled Learning Resources

Do not enroll in the Laboratory Kit resource until you have spoken to your program mentor or course instructor. Your lab kit from General Chemistry I Lab may have already included the General Chemistry II Lab materials. See below for more information on how to determine if this is the case.

Laboratory Kit

The "General Chemistry II" lab kit from Carolina Biologicals is a physical shipment. This lab kit is covered by your program lab fee and is required to complete the performance assessment for General Chemistry II Lab. This kit includes all of the science equipment, supplies, and chemicals necessary to complete the following laboratory experiments at home:

- Engineering a Better Air Bag
- Molar Mass by Freezing Point Depression
- Characteristics of Buffered Solutions
- Developing an Activity Series
- Faster Plop, Plop, Fizz, Fizz
- Equilibrium and Le Chatelier's Principle
- Qualitative Synthesis of Aspirin

Take a moment to check whether the lab kit you received for General Chemistry I Lab also contains materials for the experiments above. If it does, then you already have all of the General Chemistry II Lab materials you need and should not re-enroll in lab resource below. If your General Chemistry I Laboratory kit did not come with the experiments above, then you should go ahead and use the link below to enroll in the General Chemistry II Lab resource separately.

The lab manual with lab instructions can be found using the link below. It can also be found in Taskstream and the course search feature. Editable copies of the lab report sheets are also available for download in Taskstream. The experiments reinforce science content and teach laboratory techniques. At the completion of the course you will have completed the labs required for your final student project.

- Ordering Your Chem II Lab Course Kit
- Lab Manual

Automatically Enrolled Learning Resources

You can access the learning resources listed in this section by clicking on the links provided throughout the course. You may be prompted to log in to the WGU student portal to access the resources.

WileyPLUS

The WileyPLUS General Chemistry learning resource is an online course complete with readings, videos, and interactive exercises. Targeted feedback and self-assessment tools, as well as trackable exercises, will help you assess your strengths and quickly address misconceptions. The assignments are designed to guide you through the full course.

The WileyPLUS General Chemistry learning resource utilizes the following e-text:


Course Instructor Support

Your course instructor team is prepared to help you reach your educational goals. As subject matter experts, course instructors are fully committed to your success. You are encouraged to contact your course instructor team as soon as you begin the course. Course instructors are able to share study tips, and provide guidance in assessment preparation strategies and troubleshoot specific content areas. You can contact the course instructors at the following email: chemistry@wgu.edu
If you would like to schedule an appointment with one of your course instructors, you can do so by accessing the team calendar.

**Pacing Guide**
The following pacing guide outlines important activities in this course and C289 and suggests a weekly structure to pace your completion of the learning activities. The pacing guide is provided as a suggestion and does not represent a mandatory schedule.

Please refer to the Enhanced Pacing Guide for a comprehensive view of the specific WileyPLUS General Chemistry learning resources that align to each of the learning outcomes within this course.

If you think you may be ready to take the pre-assessment right away upon starting the course--or if you've already worked through the material and want a way to check your overall test readiness before attempting the pre-assessment or objective assessment--then you'll want to make use of the Chem II Test Prep in WileyPLUS! Checkpoint Quizzes are also available in WileyPLUS to allow you to check your mastery of concepts every 2-3 chapters.

**Week 1**

- Meet with a CM to discuss requirements and success tips for the General Chemistry II and General Chemistry II Laboratory courses and to talk about when to take the first pre-assessment for General Chemistry II. It is generally not recommended that you take the pre-assessment immediately upon starting a chemistry course. The Chem II Test Prep assignment is a great way to gauge your readiness for the pre-assessment--be sure and talk with a CM about the results if you decide to use it!
- Set up at least one CM appointment every other week for the first month of the course. Adjust as necessary.
- The Nature of the Gaseous State and the Effects of Conditions (WileyPLUS 39 10RA Resources)
  - Complete "Engineering a Better Air Bag" lab for General Chemistry Laboratory II
- The Nature of the Gaseous State and the Effects of Conditions (WileyPLUS 40 10QA Questions)
- The Solid and Liquid States (WileyPLUS 41 11RA Resources)
- The Solid and Liquid States (WileyPLUS 11QA Questions)

**Week 2**

- The Liquid State and Changes in State (WileyPLUS 43 11RB Resources)
- The Liquid State and Changes in State (WileyPLUS 44 11QB Questions)
- Checkpoint Quiz Chapters 10-11 (WileyPLUS 44)
- Solutions and the Quantities Involved (WileyPLUS 45 12RA Resources)
- Solutions and the Quantities Involved (WileyPLUS 46 12QA Questions)

**Week 3**
• The Effects of Solutes on the Properties of Water (WileyPLUS 47 12RB Resources)
  ▪ Complete "Molar Mass by Freezing Point Depression" lab for General Chemistry Laboratory II
• The Effects of Solutes on the Properties of Water (WileyPLUS 48 12QB Questions)
• Acids, Bases, and the Formation of Salts (WileyPLUS 49 13RA Resources)
• Acids, Bases, and the Formation of Salts (WileyPLUS 50 13QA Questions)

Week 4

• The Measurement of Acid Strength (WileyPLUS 51 13RB Resources)
  ▪ Complete "Characteristics of a Buffer" lab for General Chemistry Laboratory II
• The Measurement of Acid Strength (WileyPLUS 52 13QB Questions)
• Salts and Oxides and Acids and Bases (WileyPLUS 53 13RC Resources)
• Salts and Oxides and Acids and Bases (WileyPLUS 54 13QC Questions)
• Checkpoint Quiz Chapters 12-13 (WileyPLUS 54)

Week 5

• Redox Reactions (WileyPLUS 55 14RA Resources)
• Redox Reactions (WileyPLUS 56 14QA Questions)
• Spontaneous and Nonspontaneous Redox Reactions (WileyPLUS 57 14RB Resources)
  ▪ Complete "Developing an Activity Series" lab for General Chemistry Laboratory II
• Spontaneous and Nonspontaneous Redox Reactions (WileyPLUS 58 14QB Questions)

Week 6

• Collisions of Molecules and Reactions at Equilibrium (WileyPLUS 59 15RA Resources)
  ▪ Complete "The Scientific Method" lab for General Chemistry Laboratory II
• Collisions of Molecules and Reactions at Equilibrium (WileyPLUS 60 15QA Questions)
• The Quantitative Aspects of Reactions at Equilibrium (WileyPLUS 61 15RB Resources)
  ▪ Complete "Equilibrium and Le Chatelier’s Principle" lab for General Chemistry Laboratory II
• The Quantitative Aspects of Reactions at Equilibrium (WileyPLUS 62 15QB Questions)
• Checkpoint Quiz Chapters 14-15 (WileyPLUS 62)

Week 7

• Naturally Occurring Radioactivity (WileyPLUS 63 16RA Resources)
• Naturally Occurring Radioactivity (WileyPLUS 64 16QA Questions)
• Induced Nuclear Changes and Their Uses (WileyPLUS 65 16RB Resources)
• Induced Nuclear Changes and Their Uses (WileyPLUS 66 16QB Resources)

Week 8
- Functional Groups (WileyPLUS 67 17RA Resources)
  - Complete "Aspirin Synthesis" lab for General Chemistry Laboratory II
- Functional Groups (WileyPLUS 68 17QA Questions)
- Three Basic Types of Biochemical Compounds (WileyPLUS 69 18RA Resources)
- Three Basic Types of Biochemical Compounds (WileyPLUS 70 18QA Questions)
- Checkpoint Quiz Chapters 16-18 (WileyPLUS 70)

**Week 9**

- Prepare for Chem II Test (WileyPLUS 71)
- Chemistry II Test Prep (WileyPLUS 72)
- Take the pre-assessment for General Chemistry II

**Week 10**

- Write the reflective essay for General Chemistry II Laboratory and submit the completed task in Taskstream
- Take the objective assessment for General Chemistry II

*Note: This pacing guide does not replace the course. Please continue to refer to the course for a comprehensive list of the resources and activities.*

**General Chemistry II Laboratory**

This course is designed to provide you with a broad overview of chemistry and a fundamental understanding of basic lab techniques. Topics include the following:

- laboratory safety
- laboratory techniques in the classroom
- physical states
- aqueous solutions
- acids, bases and salts
- oxidation-reduction reactions
- reaction rates and equilibrium
- organic chemistry

To master these topics you will utilize resources in C289: General Chemistry II and the physical lab kit.

**Final Steps**

Congratulations on completing the activities in this course! This course has prepared you to complete the performance assessment associated with this course. If you have not already been directed to do so, please access the assessment via the course search feature in Taskstream. You will need to submit your lab reports and reflective essay to complete the assessment.