

Dr. Shannon C. Riha
Associate Profess of Chemistry
Email: sriha@uwsp.edu
Office: CBB 448

CHEMISTRY 105: FUNDAMENTAL CHEMISTRY

COURSE DESCRIPTION

Chemistry is the study of matter and the transformations of matter. Chemistry is not just chemicals. *Chemistry is at the heart of cooking*—how is cheese made? What makes bread rise?; *Chemistry explains how things work*—what powers your cell phone? What illuminates your computer screen or TV? How can we use the sun's energy to create electricity and fuels?; *Chemistry keeps you safe and informed*—what household chemicals can be safely mixed and which ones are dangerous to keep together? It gives you a basic understanding of product labels; *Chemistry keeps you healthy*—chemistry is medicine, vitamins and supplements. Chemistry is central to the world around you.

Chemistry 105 is intended to introduce the elementary theories and language of chemistry, provide the student with essential analytical reasoning and problem-solving skills, and serve as the foundation to advanced chemistry and science courses. Topics covered in this class include: 1) matter and measurements in chemistry, 2) atomic and molecular structure, 3) chemical bonding, 4) chemical reactions and stoichiometry, and 5) thermochemistry. I hope that this class will not simply feel like another "requirement" course, but rather an eye-opening class to understanding the world around you and how chemistry is creating a better tomorrow.

LEARNING OUTCOMES

At the end of this course, a successful student will be able to:

- **Apply** chemistry ideas and language to describe and enhance your understanding of the physical phenomenon around you.
- **Solve** a variety of chemical problems utilizing analytical reasoning and problem-solving strategies.
- **Perform** important laboratory techniques and methods with a safety-conscious attitude.
- **Communicate** scientifically by making, recording, and interpreting laboratory measurements.

CLASS SESSIONS

	Section	Day(s)	Time	Location	Instructor
LECTURE	05/5H	M, T, R	2:00	CBB105	Riha
DISCUSSION	05/5HD1	W	2:00	CBB105	Riha
LAB	5HL1	T	8:00	CBB226	Riha
	05L1	W	8:00	CBB226	Riha
	05L2	R	8:00	CBB226	Riha
	02L3	F	11:00	CBB226	Riha

COURSE COMPONENTS

Lecture is designed to introduce you to the concepts that define quantitative chemical analysis. My lecture style promotes active learning by introducing you to the theory and methods first through assigned readings and reading guides. You will then generate a deeper understanding of the concepts and apply your knowledge with in-class activity sets, lab activities, and out of class practice sets.

Lab is the "hands-on" experience essential to learning chemistry and critical to your success in this course. It gives you the experience of putting the key concepts you covered in lecture into practice, teaches you experimental techniques, and helps you better learn how to problem solve.

REQUIRED MATERIALS

- **Course text**
 - Chemistry: Structure and Properties*, Tro
 - Available at text rental in the Campus Bookstore
- **Laboratory manual**
 - LabFlow*—your virtual lab manual
 - Available for purchase in the Campus Bookstore or at www.LabFlow.com
 - Follow the instructions on Canvas under the module labeled “Introduction to *LabFlow*”. Your **enrollment code** depends on your lab section as highlighted in the Table on Canvas. Your enrollment code will grant you access to *LabFlow* until September 20th, after which you will need to activate (pay for) *LabFlow*.
- **Laboratory notebook**
 - Permanently bound notebook such as a composition notebook
 - Available for purchase in the Campus Bookstore or any office supply store
- **Lab goggles**
 - Must be chemical resistant, splash proof goggles; safety *glasses* **not** approved for use.
 - Available for purchase in the Campus Bookstore
- **Calculator**
 - Any non-programmable calculator that can do logarithms and exponentials.
 - Available for purchase in the Campus Bookstore or at any office supply store
- **Aktiv Chemistry**
 - On-line active learning system.
 - Available for purchase at <https://aktiv.com/chemistry/>
 - Follow the instructions on Canvas under the module called “Introduction to Aktiv Chemistry”. Your class code is **PHFLUS**, which will grant you trial access until September 20th, after which you will need to activate Aktiv Chemistry.

ASSESSMENT

Your progress in this course will be assessed based on both in-class and lab performance.

Exams. A midterm exam will be given approximately half-way through the semester and will be cumulative. The final exam will be given at the end of semester and will be cumulative of the second half of the semester. Both the midterm and final exam will be multiple choice. Exam dates and times are found in the Lecture Schedule and will not change.

Reading Activities. To get the most out of this course, it is crucial you come to lecture/discussion prepared. The reading activities will guide you on what concepts and learning outcomes are covered in each section of the assigned text. Reading activities are due by noon on the day of the lecture/discussion period via *Aktiv Chemistry*.

Pre-lab Quizzes. Coming to lab prepared will ensure you are able to use the laboratory time efficiently. Items that will prepare you for lab include: i) reading through the lab; ii) watching the videos; and iii) completing the pre-lab quizzes by the Sunday at 11:59 pm before your lab. All these items are available through *LabFlow*.

Quizzes. Quizzes will be multiple choice and given approximately every other week (6 total) during the lecture period. Material on quizzes will include that covered in lecture/discussion activities and reading assignments. The dates for quizzes can be found in the Lecture Schedule below and will not change.

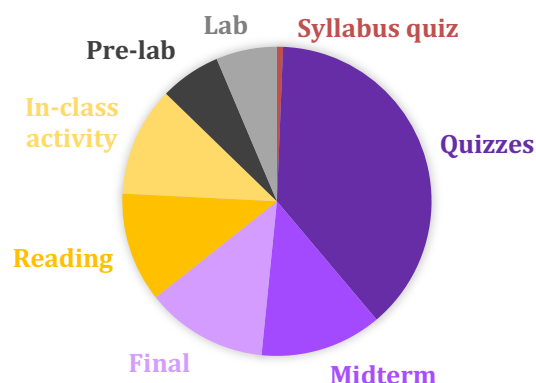
In-class Activities. The in-class activities are your chance to put the concepts covered in the reading activities to practice in a low-stakes environment. In-class activities must be completed in the classroom utilizing *Aktiv Chemistry*. Points will be assigned based on effort, not correctness.

Lab Reports. During your lab period you will collect and record all the data (in a laboratory notebook) needed for the lab. You will then upload and submit your data in *LabFlow* by Sunday at 11:59 pm the same week you completed the lab. There is also a lab safety quiz due the first week of class.

GRADING

The grade you receive for the course will be based on the following:

Syllabus Quiz	5
Lecture Quizzes (50 pts each)	300
Midterm Exam	100
Final Exam	100
Pre-lab Quizzes (top 10 @ 5 pts each)	50
Lab Reports (top 10 @ 5 pts each)	50
Reading Activities (top 45 @ 2 pts each)	90
In-class Activities (top 45 @ 2 pts each)	90
TOTAL	785



Grading scale cut-offs: **A** (100-93%); **A-** (<93-90%); **B+** (<90-87%); **B** (<87-83%); **B-** (<83-80%); **C+** (<80-77%); **C** (<77-73%); **C-** (<73-70%); **D+** (<70-67%); **D** (<67-63%); **F** (<63%)

Note: The cut-off percentages may be adjusted at the end of the semester; however, I will never adjust the cut-off percentages higher. This means if you get an 83% you will not receive any lower than a B for the final grade. To move onto CHEM106 you must receive a grade of a C- or better. *I do not provide extra credit opportunities or "bump" students up to a higher grade, however, if I have made a mistake in grading an assignment or exam, let me know right away so I can fix it. I welcome you to discuss your grade with me at any point in the semester and am happy to provide you with study strategies to help you earn a solid grade in this course.*

THE FINE PRINT

COMMUNICATION. Make it a habit to check your email and Canvas page daily for announcements and due dates. If something comes up (no matter how big or small) please reach out to me. I will try and help in any way I can.

ABSENCES. I fully realize that life happens outside of the classroom. Extenuating circumstances may arise during the semester for many different reasons that result in missed class time. If extenuating circumstances arise, it is imperative you contact me via email as soon as possible.

- Per University Policy, make-up quizzes/exams, will be scheduled under the following circumstances: UWSP scheduled athletic event (written authorization from coach), family emergency (documentation such as an obituary), medical emergency (written authorization from physician), armed forces training/drills (written authorization from supervising officer), or the like. **Make-up quizzes/exams for excused absences must be completed within two business days of the originally scheduled date.**
- Make-up labs will not be granted (including for excused absences), however, you can use one of the two dropped labs to avoid any penalty. There are no virtual labs.

FLEXIBLE GRADING. My grading policy is designed to provide flexibility and equity to all students in the classroom. As such, the following substitutions and drops are in place to allow each student a limited opportunity to not be penalized in the event of missed work or poor performance.

- **Pre-lab quizzes/lab reports:** There are twelve labs over the course of the semester. I will drop your lowest lab two pre-lab quizzes and lab reports.

- **Reading/In-class Activities:** There are approximately 50 reading and 50 in-class activities planned for the semester (see lecture schedule). Your lowest *five* scores for each activity will be dropped. Late submissions of reading quizzes are allowed with a 3% deduction.
- **Quizzes:** The percentage you receive on the midterm exam can be used to replace one of your lowest Quiz 1, 2, or 3 scores. Likewise, a successful final exam score (percentage) can be used to replace your lowest Quiz 4, 5, or 6 scores.

STUDY HINTS. This course will be challenging for most students; therefore, to be successful in the course, it is recommended that you put forth a constant effort in engaging with the material both in and out of the classroom. As a full-time student, it is generally suggested that for every class credit taken, 2-3 h are spent outside of the classroom studying. The following study hints will help you succeed in CHEM105:

- Complete the reading activities prior to the associated lecture. These are broken into small and manageable chunks to promote active engagement with the material each day. However, you may find it works better in your schedule to do all the reading activities for the week over the weekend. If you find yourself in this scenario, be sure to take breaks to give your brain some rest.
- Take notes while completing the reading assignments (follow the reading guides) and jot down any questions or note any muddy points in the content. Leave some room to add in notes from key points addressed in lecture.
- Attempt the practice problems associated with the reading activities.
- Make a sincere effort to work through the in-class problems. There is no penalty for an incorrect answer so there is no harm in trying a problem even if you are unsure where to start. Doing this will help you sharpen and become more confident in your problem-solving skills.
- Form study groups. Working with other students in the course is a great way to build off each other's strengths and see how to approach problems in different ways.

HELP & RESOURCES. If you are feeling lost or overwhelmed, there are many resources to get help in this class to maximize your learning experience. Seek help early and often!

- **Canvas:** Course information (syllabus, reading guides, learning outcomes/study guides, due dates, and other supporting material) will be available on the course Canvas page. You can also find a running total of your points for the course.
- **Office Hours:** I am dedicated to help you learn; all you have to do is ask. I have set office hours on Mondays, Wednesdays, and Fridays (see schedule below). If those times do not work for you, feel free to e-mail me to set up an appointment.
- **TIMS @ UWSP:** Tutors are UWSP students who have done well in their classes and who are here to share their successful study habits and chemistry content knowledge to help others succeed. Discussing chemistry concepts and processes together clarifies and solidifies knowledge, and the tutors are eager to study with you. Links to group and drop-in tutoring schedules can be found at: <http://www.uwsp.edu/tlc>
- **Disability Services:** UWSP is committed to providing students with disabilities the academic accommodations and auxiliary aids necessary to ensure access to all university services, programs, and activities. Disability Resource Center (DRC) is responsible for determining these accommodations. Visit the DRC website to find out more: <http://www.uwsp.edu/disability/Pages/default.aspx>

ACADEMIC INTEGRITY. Academic misconduct is serious and can follow you throughout your entire academic and professional career. You are a student at the University of Wisconsin-Stevens Point and you should know the student academic standard and disciplinary procedures. More information can be found at: <http://www.uwsp.edu/dos/Pages/Academic-Misconduct.aspx>.

SCHEDULES

Dr. RIHA'S SCHEDULE

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00	R, P, G	105 Lab 5HL1 CBB226	105 Lab 05L1 CBB226	105 Lab 05L2 CBB226	R, P, G
09:00	Office hour CBB448	105 Lab 5HL1 CBB226	105 Lab 05L1 CBB226	105 Lab 05L2 CBB226	Office hour CBB448
10:00	CHEM299	105 Lab 5HL1 CBB226	105 Lab 05L1 CBB226	105 Lab 05L2 CBB226	R, P, G
11:00	CHEM299	R, P, G	R, P, G	CHEM299	105 Lab 05L3 CBB226
12:00	CHEM299	R, P, G	R, P, G	CHEM299	105 Lab 05L3 CBB226
13:00	CHEM299	R, P, G	R, P, G	CHEM299	105 Lab 05L3 CBB226
14:00	105 Lec 05 CBB105	105 Lec 05 CBB105	105 Dis 05D1 CBB105	105 Lec 05 CBB105	CHEM229
15:00	R, P, G	R, P, G	Office hour CBB448	R, P, G	CHEM299
16:00	R, P, G	R, P, G	R, P, G	R, P, G	CHEM299

LECTURE SCHEDULE

Week	Topic	Reading	Quiz/Exam Dates
1	Units, Measurements, Problem Solving	Ch. E	
2	Atoms and the Mole	Ch. 1	
3	Model of the Atom	Ch. 2	Sept. 19: Quiz 1
4	Periodic Properties of the Elements	Ch. 3	
5	Periodic Properties of the Elements Molecules and Compounds	Ch. 3 Ch. 4	Oct. 3: Quiz 2
6	Molecules and Compounds Chemical Bonding	Ch. 4 Ch. 5	
7	Chemical Bonding	Ch. 5	Oct. 17: Quiz 3
8	Molecular Geometry and Bonding	Ch. 6	
9	Chemical Reactions	Ch. 7	Oct. 31: Midterm
10	Chemical Reactions Reactions in Aqueous Solutions	Ch. 7 Ch. 8	
11	Reactions in Aqueous Solutions	Ch. 8	Nov. 14: Quiz 4
12	Reactions in Aqueous Solutions Thermochemistry	Ch. 8 Ch. 9	
13	Thermochemistry	Ch. 9	Nov. 28: Quiz 5
14	Gases	Ch. 10	
15	Gases and Review	Ch. 10	Dec. 1: Quiz 6
16	Finals Week		Final Exam: Dec. 16, 2:45 – 4:00

LAB SCHEDULE

Week	Date	Experiment	Pre-Lab Quiz Due Date*	Lab Report Due Date*
1	9/6-9/9	Safety and Check in	-	9/11
2	9/12-9/16	Exp. 1: Basic Laboratory Techniques	9/11	9/18
3	9/19-9/23	Exp. 2: Density & Specific Gravity	9/18	9/25
4	9/26-9/30	Exp. 3: Empirical Formulas	9/25	10/2
5	10/3-10/7	Exp. 4: Water Content of a Hydrated Salt	10/2	10/9
6	10/10-10/14	Exp. 5: Introduction to Light & Matter	10/9	10/16
7	10/17-10/21	Exp. 6: Spectrophotometric Determination of Iron	10/16	10/23
8	10/24-10/28	Exp. 7: Classification of Amino Acids	10/23	10/30
9	10/31-11/4	Exp. 8: Quantitative Separation of a Mixture	10/30	11/6
10	11/7-11/11	Exp. 9: Chemistry of Copper & Percent Yield	11/6	11/13
11	11/14-11/18	Exp. 10: Titration. Determining the Concentration of an Acid with Standardization	11/13	11/20
12	11/21-11/25	No Labs this week — Thanksgiving Holiday!	-	-
13	11/28-12/2	Exp. 11: Constant Pressure Calorimetry	11/27	12/4
14	12/5-12/9	Exp. 12: Ideal Gas Law	12/4	12/11
15	12/12-12/15	Check out	-	-
16	12/19	No Lab		

Pre-lab Quizzes and Lab Reports are due by 11:59 pm on the date listed in the schedule

Goggles, close-toed shoes, and long pants are required for entry into the lab