

CHEM 105 - GENERAL CHEMISTRY I

Section 004

Fall 2014

Instructor: Dr. Snyder

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Office: 109B Sims

Office Hours: M 11:00-12:00; R 10:00-11:00 or by appointment

Course Credit Hours: 4

Lecture: MW 9:30-10:45 am (Sims 105) and TR 12:30-1:45 pm (Sims 209)

Required Textbook:

- ❖ **General Chemistry**, McQuarrie, Rock and Gallogly, 4th edition
- ❖ Sapling Learning online homework

Course Objectives and Student Learning Outcomes: Students completing this course successfully will:

- ❖ Demonstrate competence in fundamental general chemistry topics
- ❖ Develop their problem-solving and critical thinking skills
- ❖ Develop their ability to effectively communicate with other chemists using proper scientific terminology.

Course Outline: In the first semester of general chemistry, we will examine the following topics as time permits:

- ❖ The Structure of the Atom and the Periodic Table
- ❖ Structure and Properties of Ionic and Covalent Compounds
- ❖ Thermodynamics
- ❖ Stoichiometry
- ❖ Intermolecular Forces
- ❖ Chemical Equilibrium
- ❖ Nuclear Chemistry
- ❖ Electrochemistry

Class Preparation: You will get more from a class period if you spend time preparing ahead of time. Therefore, you should:

- ❖ Read assignments before class. This will give you a better understanding of the topics being discussed and you will be able to take better notes.
- ❖ Attend class. If you miss class, it is your responsibility to obtain lecture notes from another student in the class.
- ❖ Devote time to class each day. This is a rigorous course that requires daily preparation. Work homework problems daily; online homework and assigned practice problems from the end of each chapter.
- ❖ Take good notes. I highly recommend rewriting your notes as soon as possible after class.
- ❖ **Do not fall behind**

Recitation: Thursday from 12:30-1:45 will serve as our recitation period. This will be a time to ask questions about lecture material and/or homework problems.

Exams and Grading:

1. There will be three exams worth 150 points. **No make-up exams will be given.** Tentative exam dates are noted on the schedule. If you miss an exam with a valid excuse, the missed exam grade will be replaced with your final exam grade scaled to 100 points.
2. There will be a comprehensive final exam, worth 250 points. You must take the final exam and make at least a 50% on the final in order to pass the course.
3. There will be 7-8 quizzes given throughout the semester worth 20 points each. See schedule for quiz dates. Quizzes will be given at the end of class and will last approximately 15 minutes. **No make-up quizzes or time extensions will be given.** Your lowest two quiz grade will be dropped before calculating final grades. If you miss a quiz for any reason, the missed quiz will be the quiz grade that is dropped. This is a tentative quiz schedule. The maximum point total for quizzes will not exceed 120 points. If for some reason we miss a quiz, the point total for quizzes will be adjusted accordingly. **Quizzes are often printed on both sides of the paper. Be sure to check the back of a quiz for additional problems.**
4. There will be a chapter homework assignment for each chapter. There will be about 15-18 homework assignments for the semester depending on how many chapters we have time to complete. Your lowest three homework grades will be dropped prior to calculating your final homework grade. Homework assignments will be completed through the Sapling Learning online homework system. You will need to purchase a one semester access to Sapling Learning's Online homework system at <http://saplinglearning.com> or through the bookstore. Each homework assignment will be worth 100 points. Your homework grades will be averaged at the end of the semester and scaled to 100 points. **Homework assignments will be due three days after we finish a chapter. Due dates will be specified at the time the assignment is made and will be indicated in the online homework system.** Late assignments will not be accepted.
5. Exams and quizzes will be mostly written exams with problems and short answer questions. When solving problems, it will be required that you show all work and report all answers to the correct number of significant figures with the correct units. Any answer without the supporting work will be marked wrong.
6. You have one week from the time a graded assignment is returned to ask questions about the way it was graded. After a week, I will not change a grade.
7. Letter grades will be assigned as follows: A 100-90%; B+ 89-86%; B 85-77%; C+ 76-74%; C 73-66%; D 65-56%
8. You should carefully read the Winthrop University Student Conduct Code printed in the Winthrop University Student Handbook. As noted in the Student Conduct Code: Responsibility for good conduct rests with students as adult individuals. This policy on student academic misconduct is outlined in the Student Conduct Code Academic Misconduct Policy in the online *Student Handbook* <http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf>

Total Possible Points

Exams	450 points
Final Exam	250 points
Quizzes	120 points (max)
Homework	100 points
Total possible points (max)*	920 points

*total number of points for the course may be lower than 920 depending on the number of quizzes.

To purchase access to the Sapling Learning online homework system:

1. Go to <http://saplinglearning.com>
2. If you already have a Sapling Learning account, log in, click "View Available Courses", then skip to step 3.
 - 2b. If you have a Facebook account, you can use it to quickly create a SaplingLearning account. Click "create account" located under the username box, then click "Login with Facebook". The form will auto-fill with information from your Facebook account (you may need to log into Facebook in the popup window first). Choose a password and time zone, accept the site policy agreement, and click "Create my new account". You can then skip to step 3.
 - 2c. Otherwise, click "create account" located under the username box. Supply the requested information and click "Create my new account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
3. Find your course in the list (listed by school, course, and instructor) and click the link.
4. Select your payment options and follow the remaining instructions.
5. Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.
6. During sign up - and throughout the term - if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling support team is almost always more able (and faster) to resolve issues than your instructor.

Blackboard: We will be using Blackboard this semester. I will post grades and course information in Blackboard. Some lectures will be PowerPoint presentations which will be posted in Blackboard. The web address to log into Blackboard is ***online.winthrop.edu***. **Login instructions and Blackboard tutorials can be found at http://www2.winthrop.edu/webct/Blackboard_Training_Tutorials.html**

Office Hours: I will hold office hours in my office on Mondays from 11:00-12:00 and Thursdays from 10:00-11:00.

Grades: I will not discuss grades through e-mail. If you have a question about your grade, please stop by my office.

Recommend class materials: I recommend that you bring your textbook, notes, completed homework problems, and a calculator to every class.

Exams and Quizzes: You will need a calculator for exams and quizzes. Cell phones and pagers are strictly prohibited during exams and quizzes. You cannot use a cell phone as a calculator during exams and quizzes.

Course Withdraw: October 24th is the last day to withdraw from a full fall semester course with an automatic N grade issued. *Students may not withdraw from a course after this date without documented extenuating circumstances* as determined by the University.

Communication: If you have any questions, please stop by and see me during office hours. If these hours are not convenient, see me in class or e-mail me to set up an appointment.

Attendance: You are expected to attend all class meetings. You are responsible for all announcements made in class. Absence or lateness does not excuse you from this responsibility.

Homework: You are expected to complete each reading assignment and all assigned homework and practice problems. End of chapter practice problems from the textbook will not be collected or graded.

Students with Disabilities: Winthrop University is dedicated to providing access to education. If you have a disability and require specific accommodations to complete this course, contact the Office of Disability Services (ODS) at 323-3290. Once you have your official notice of accommodations from the Office of Disability Services, please inform me as early as possible in the semester.

Winthrop's Academic Success Center: Winthrop's ASC is a free resource for all undergraduate students seeking to perform their best academically. The ASC offers a variety of personalized and structured resources that help students achieve academic excellence, such as tutoring, academic skill development (test taking strategies, time management counseling, and study techniques), and group/individual study spaces. The ASC is located on the first floor of Dinkins, Suite 106. Tutoring for this specific course is offered through the office. If you wish to request a tutor, you must attend ONE Tuttee Seminar, offered every Friday until October 24th. Please contact the ASC at 803-323-3929 or success@winthrop.edu if you have any questions. For more information on ASC services, please visit www.winthrop.edu/success.

University-Level Competencies in the Touchstone Program: CHEM 105 is completed as part of the University's Touchstone Program. CHEM 105 will contribute to Competency 1 of the University-Level Competencies.

Competency 1: Winthrop graduates think critically and solve problems.

The major focus of this course is to develop student critical thinking through extensive problem solving. Students actively engage in solving problems and developing critical thinking, organization, and skills needed to successfully solve scientific problems.

General Education Requirements: CHEM 105 fulfills four hours of general education requirement for natural sciences. Listed below are the student learning outcomes for natural science courses that CHEM 105 will fulfill as well as examples of how they will be fulfilled.

Students should be:

1. Conversant with a few fundamental concepts from among the three main areas of natural science, including earth, life, and physical sciences.

This course covers the fundamental concepts of chemistry in great detail at a more advanced and in-depth level than CHEM104 and over a much broader range of subjects. The course's content includes the concepts of matter and energy, modern atomic structure; chemical equations and reaction stoichiometry; solutions; acid-base chemistry; thermodynamics, equilibria, and electrochemistry.

2. Able to apply the scientific methodologies of inquiry.

Students will apply scientific methodologies to develop testable hypotheses about molecular structures, photon energies, reaction products, equilibria, thermal energy generation and many other natural processes.

3. Able to discuss the strengths and limitations of science.

Students will develop an understanding of the strengths and limitations of scientific methods. Extensive discussions of energy, energy generation, consumption.

4. Able to demonstrate an understanding of the history of scientific discovery.

Students will be expected to demonstrate an understanding of the history of scientific discovery. For example they will be expected to demonstrate an understanding of subatomic particle discoveries during the early 1900s, atomic line spectra observed during the 1800's, and the discovery of nuclear fission processes during the 1930s.

6. Able to communicate about scientific subjects including (lab courses only) the defense of conclusions based on one's own observations.

Students will be required to communicate on scientific subjects through clearly organized, logical, well-supported, and quantitative student-generated solutions to scientific problems covering a broad range of scientific subjects

General Education Writing Component: This course will include evaluated student written expression from graded exercises that include quizzes, exams and the final cumulative examination. You will be required to demonstrate a well-documented, organized approach to each solved problem. You will be required to effectively express the key mathematical relationships, illustrate steps in equation rearrangement, use and express correct

units, document cancellation of units used, and report all mathematical answers with the correct number of significant figures with the proper units.

Note: This is a working document; changes will be made as the semester progresses. I will change errors as needed.

This is a tentative schedule. It will change as necessary. Check Sapling Learning for online homework due dates.

Date	Quizzes and Exams	Chapter Sections	Homework Problems (Even problems only unless otherwise indicated)
T, 8/26 W, 8/27		Ch. 1, 2, 3 Ionic Compounds	Ch. 1: 6, 8, 12-18, 24, 30-46, 64, 74, 76 Ch. 2: 8, 14, 16, 18, 20-26, 42-64, 77 Ch. 3: 12, 22 Ch. 6: 4, 6, 8, 10, 12, 14, 16, 18 Ch. 10: 2, 4, 6, 10, 12, 14, 24
R, 8/28	Recitation- Online Quiz 1 due by 11:59 pm on Thursday, 8/28		
M, 9/1	Labor Day, No Class		
T, 9/2 W, 9/3		Balancing chemical equations	Ch. 3: 2, 4, 6, 28, 30, 34, 36
		Supplement 1 Sections 1-4	Ch. 11: 1, 2, 7, 8, 31, 32, 33, 34, 37 Supplement 1 is posted in Blackboard
R, 9/4	Recitation- Online Quiz 2 due by 11:59 pm on Thursday, 9/4		
M, 9/8 T, 9/9		4.1-4.9	Ch. 4: 2, 4, 6, 14-26, 27, 28, 29, 30, 32, 33, 38, 40, 46, 54, 55, 61
W, 9/10	Quiz 3		
R, 9/11	Recitation		
M, 9/15 T, 9/16		5.1- 5.12	Ch. 5: 1, 4, 5, 7, 8, 9, 10, 12, 13, 14, 18-40, 44, 46, 48, 50, 52, 56, 58, 60, 62
W, 9/17	Quiz 4	Ch. 6	Ch. 6: 4-18, 24, 26, 30-44
R, 9/18	Recitation		
M, 9/22		Ch. 7	Ch. 7: 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 18, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 46, 48, 50
T, 9/23		Ch. 7	
W, 9/24	Exam 1		
R, 9/25	Recitation		
M, 9/29		Ch. 7	
T, 9/30 W, 10/1		8.1-8.8	Ch. 8: 2-40, 56, 58, 61, 62, 64, 66
R, 10/2	Recitation		
M, 10/6		8.9, 7.10, 7.11	Ch. 7: 35, 36, 38

T, 10/7		Ch. 9	Ch. 9: 22-42 Explain bonding for 22, 24, 28, 30; predict hybridization based on the electron pair geometry for 26, 32, 34, 36, 38
W, 10/8	Quiz 5	Ch. 9	
R, 10/9	Recitation		
M, 10/13 T, 10/14		15.4 Ch. 10	Ch. 15: 13, 14, 15, 16, 17, 18, 19, 20 Ch. 10: 2-14, 18-30, 34-38, 42-52, 58-66
W, 10/15	Quiz 6	10.11, 24.1-24.2 11.1-11.2, 11.7	Ch. 24: 3, 4, 6, 14, 16, 19, 20
R, 10/16	Recitation		
M, 10/20	Fall Break, No Class		
T, 10/21 W, 10/22		11.8-11.11	Ch. 11: 2, 4, 8, 32-38, 37, 50-62
R, 10/23	Recitation		
F, 10/24	Withdraw deadline		
M, 10/27		Ch. 12	Ch. 12: 2-10, 16-18, 22-30
T, 10/28		Ch. 14	Ch. 14: 2, 8, 10, 12, 18, 20, 22, 26, 28-44, 48-58
W, 10/29	Exam 2		
R, 10/30	Recitation		
M, 11/3 T, 11/4 W, 11/5		Ch. 14 Nuclear Chemistry	
R, 11/6	Recitation		
M, 11/10 T, 11/11		Ch. 23 Ch. 23	Ch. 23: 2-12, 16-22, 36 (calc. ΔG_{rxn} only), 40, 64, 65, 81, 85a
W, 11/12	Quiz 7	Ch. 19	Ch. 19: 2, 4, 6, 10, 12, 18, 20, 26, 36, 38, 50, 52, 58
R, 11/13	Recitation		

M, 11/17 T, 11/18		Ch. 19 23.7-23.8	Ch. 23: 26, 28, 30, 36, 40, 68, 85a, b
W, 11/19	Quiz 8	20.1-20.4	Ch. 20: 1, 2, 3, 4, 5, 6, 7, 8, 12, 16, 1, 20, 22, 24, 26, 2859, 62
R, 11/20	Recitation		
M, 11/24		20.5-20.11	
T, 11/25		21.1-21.2	Ch. 21: 2-8
W, 11/26 R, 11/27	Thanksgiving Break		
M, 12/1		Ch. 25	
T, 12/2		Ch. 25	
W, 12/3	Exam 3		
R, 12/4	Recitation		
M, 12/8	Review		
T, 12/16	Final 11:30 am, Sims 105		