

CHEM 105 - GENERAL CHEMISTRY I

Section 002

Spring 2015

Instructor: Dr. Snyder

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Office: 109B Sims

Office Hours: Mondays 10:00-11:00, Wednesdays 1:00-2:00 or by appointment

Course Credit Hours: 4

Lecture: MWF 8:00-9:15 am (Sims 105)

Required Materials:

- ❖ **Textbook:** *General Chemistry*, McQuarrie, Rock and Gallogly, 4th edition
- ❖ Access to ALEKS (<http://www.aleks.com>)
- ❖ Scientific Calculator (It does not have to be a programmable calculator)

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 from the textbook daily.
- ❖ Work on ALEKS daily. Complete each topic by the due date.
- ❖ Take good notes. I highly recommend rewriting your notes as soon as possible after class.
- ❖ **Do not fall behind**

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 150 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 15-20 minutes. **No make-up quizzes or time extensions will be given.** Your lowest two quiz grades will be dropped before calculating your final quiz grade. 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.
4. There will be a homework assignment for each chapter. The homework problems assigned will come from the end of chapter problems in the textbook. See the following course schedule for a list of homework problems for each chapter. These problems will not be collected or graded, but will help prepare you for quizzes and exams.
5. ALEKS is an online assessment and learning system that will **help** you with completing your homework and preparing for quizzes and exams. ALEKS is broken into topics for each chapter each with a due date. Your work in ALEKS will count as a homework grade for the course. Your ALEKS grade will be based on your on-time completion of topics and your mastery of topics by the end of the course. Your on-time completion of topics will count for 50% of the homework grade and your mastery of topics will count for 50% of the homework grade. For example, if you complete 100% of the topics by their due date and master 100% of the topics by the end of the course, your ALEKS homework grade will be 100 points. If you complete 50% of the topics by their due date and master 50% of the topics, your ALEKS homework grade will be 50 points. The [attached document](#) will provide help in getting started with ALEKS along with instructions on how to purchase an access code to ALEKS. It also has an access code which will allow you to use ALEKS for free for two weeks. Within that two week period, you will have to purchase an access code. If you wait until the two week period is over, you will be locked out of your ALEKS account until you purchase an access code to the online system.
6. 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%
7. 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

Three Exams	450 points
Final Exam	250 points
Quizzes	120 points (max)
ALEKS	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.

Graded Exams and Quizzes: 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.

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 10:00-11:00 and Wednesdays from 1:00-2:00.

Grades: I will not discuss grades through e-mail. If you have a question, 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: March 11th is the last day to withdraw from a full 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 Tutee Seminar, offered every Friday until March 13th. 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 ALEKS for topic due dates.

Date	Quizzes and Exams	Chapter Sections	Homework Problems (Even problems only unless otherwise indicated)
M, 1/12 W, 1/14 F, 1/16		Ch. 1 (1.3, 1.4, 1.7, 1.8, 1.9) Ch. 2 (2.1, 2.2, 2.5, 2.6, 2.8-2.11) Ionic Compounds (2.12, 2.7, 6.2, 6.4, 10.2 nomenclature polyatomic ions)	Ch. 1: 6, 8, 12-18, 24, 30-46, 64, 74, 76 Ch. 2: 8, 14, 16, 18, 20-26, 42-64, 77 Ch. 6: 4, 6, 8, 10, 12, 14, 16, 18 Ch. 10: 2, 4, 6, 10, 12, 14, 24
F, 1/16	Online Quiz 1- Due by 11:59 pm on Friday, 1/16 (Chapter 1)		
M, 1/19	No Class- Martin Luther King Day		
W, 1/21 F, 1/23		Ch. 3 (3.1, 3.2) Ch. 11 (11.1, -11.2, 11.7, 11.8) Supplement S1.1-S1.4	Ch. 3: 2, 4, 8, 28, 30, 34, 36 Ch. 11: 1, 2, 7, 8, 31, 32, 33, 34, 37 Supplement 1 is posted in Blackboard
F, 1/23	Online Quiz 2- Due by 11:59 pm on Friday, 1/23 (Chapter 2, 6, 10)		
M, 1/26 W, 1/28		4.1-4.9	Ch. 4: 2, 4, 6, 14-26, 27, 28, 29, 30, 32, 33, 38, 40, 46, 54, 55, 61
W, 1/28	Online Quiz 3- Due by 11:59 pm on Thursday, 1/29 (Chapter 3, 11)		
F, 1/30		4.1-4.9	Ch. 4: 2, 4, 6, 14-26, 27, 28, 29, 30, 32, 33, 38, 40, 46, 54, 55, 61
M, 2/2 W, 2/4	Quiz 4	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
F, 2/6		Ch. 6 (6.1, 6.3, 6.5, 6.6)	Ch. 6: 4-18, 24, 26, 30-44
M, 2/9	Exam 1		
W, 2/11 F, 2/13		Ch. 7 (7.1, 7.9, 7.2-7.8)	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
M, 2/16		Lewis Structures	
W, 2/18 F, 2/20		8.1-8.8 7.10, 8.9	Ch. 8: 2-40, 56, 58, 62, 64, 66 Ch. 7: 36, 38
M, 2/23 W, 2/25	Quiz 5	Ch. 9 (9.5-9.12)	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
F, 2/27		15.4	Ch. 15: 13, 14, 15, 16, 17, 18, 19, 20
M, 3/2 W, 3/4	Quiz 6	Ch. 10 (10.1-10.7, 10.9-10.11) Ch. 24 (24.1-24.2)	Ch. 10: 2-14, 18-30, 34-38, 42-52, 58-66 Ch. 24: 3, 4, 6, 14, 16, 19, 20

F, 3/6		Ch. 11.10, 11.11 (Review 11.1-11.2, 11.7, 11.8)	Ch. 11: 2, 4, 8, 32-38, 37, 50-62
M, 3/9	Exam 2		
W, 3/11	Withdraw deadline	Ch. 12 (12.1, 12.2, 12.4, 12.5)	Ch. 12: 2-10, 16-18, 22-30
F, 3/13			
3/16- 3/20	Spring Break		
M, 3/23 W, 3/25 F, 3/27		Ch. 14	Ch. 14: 2, 8, 10, 12, 18, 20, 22, 26, 28-44, 48-58
M, 3/30	Quiz 7	Ch. 14 Nuclear Chemistry Nuclear Power	Balancing nuclear equations: Practice Problems posted in Blackboard Interchapter O: O1-O3 Access on line http://mcquarriegeneralchemistry.com/
W, 4/1 F, 4/3		Ch. 23	Ch. 23: 2-12, 16-22, 36 (calc. ΔG^0_{rxn} only), 40, 64, 65, 81, 85a
M, 4/6	Quiz 8	Ch. 19	Ch. 19: 2, 4, 6, 10, 12, 18, 20, 26, 36, 38, 50, 52, 58
W, 4/8			
F, 4/10		23.7-23.8	Ch. 23: 26, 28, 30, 36, 40, 68, 85a, b
M, 4/13 W, 4/15		20.1-20.11	Ch. 20: 1, 2, 3, 4, 5, 6, 7, 8, 12, 16, 1, 20, 22, 24, 26, 28, 59, 62
F, 4/17 M, 4/20		Ch. 25 (25.1-25.5)	
W, 4/22	Exam 3		
F, 4/24	Review		
M, 4/27	Review		
M, 5/4	Final 8:00 am Sims 105		