CHEM 105 – Chemistry and Problem-Solving Fundamentals

Spring 2017

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Office Hours: T&Th 2:00-3:00 pm, or by appointment

Course Credit Hours: 4

Lectures: Section 004: Tuesday/Thursday 8:00-9:15 am / SIMS 209

Required Materials:

- *Chemistry – an atoms-focused approach*, Gilbert, Kirss, Foster.
- **A scientific calculator with logarithms and exponential functions (cell phones may NOT be used).**

Course Goals:

- Gain an understanding of the fundamental concepts of chemistry.
- Develop critical thinking and problem solving skills.
- Build a foundation of good study habits and knowledge for more advanced scientific studies.
- Better understand how science and chemistry relate to the world around us.

Course Outline:

- This is an intense problem solving course that will develop a solid foundation in chemistry and critical thinking skills.

In this course, we will examine the following topics:

- Unit Systems and Dimensional Analysis
- Basic Concepts of Matter
- Subatomic Particles, Isotopes and Nuclear Chemistry
- Electronic Structure and Chemical Periodicity
- Chemical Bonds
- Chemical Nomenclature
- Chemical Calculations: The Mole Concept and Chemical Formulas
- Chemical Calculations Involving Chemical Equations
- States of Matter
- Gas Laws
- Solutions
- Acids, Bases and Salts
- Chemical Equations: Net Ionic and oxidation-Reduction
- Reaction Equilibrium
- Reaction Kinetics

Class Preparation: You will get more from each lecture video if you spend time preparing ahead of time. Therefore, you should:

- Read assigned text sections and complete assigned homework before each lecture. This will give you a better understanding of the topics being discussed and you will be able to take better notes and ask more insightful questions if you need clarification on any of the topics discussed.
- Attend class. If you miss class, it is your responsibility to obtain lecture notes from another student in the class. You are also responsible for any announcements or schedule changes made during class, whether or not you were present.
- You are responsible for any announcements made in class, via Blackboard, or by email. Make sure you have access to your Blackboard account, that your correct email is included in the class listserver, and check your email and Blackboard accounts at least once a day for any updates.
- Devote time to study each day. This is a rigorous course that requires daily preparation. Work homework problems daily.
- Take good notes and develop good study habits. Many students with good work ethics often still need to change how they approach studying for this course. Working problems independently is necessary to improve your comprehension and problem solving skills. Supplemental work with tutors or fellow students can also be advantageous.
- Come to class prepared with problems or questions for clarification in order to get the most benefit out of the sessions.

Exams and Grading:

- There will be five exams worth 100 points each. **No make-up exams will be given**. Tentative exam dates are noted on the course 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.
- There will be a comprehensive final exam, worth 200 points. You must take the final exam in order to pass the course.
  - The final exam for section 005 will be on Saturday, April 29 at 8:00 AM in SIMS 209
- Quizzes and objective assignments will be given throughout the semester via Blackboard and in class. Normally there will be two blackboard quizzes per week, due on Thursday and Sunday nights. You will be given at least three days to complete each quiz, so missed quizzes due to computer/internet issues is not a valid excuse and you will receive a zero for that grade. The overall quiz percentages will be averaged and scaled to 100 points. **There will be no make-up quizzes.** The lowest three quiz grades will be dropped. If a quiz is missed, that grade will be one of the dropped scores.
- You are expected to complete each reading/video assignment prior to the lecture dates listed in the syllabus. This is necessary to complete the Blackboard quizzes and text homework assignments. The syllabus hyperlinks to the videos may not work well from off-campus, but all video lectures and presentation files may be accessed through Blackboard.
- The assigned homework problems listed in red in the syllabus are due on the assigned dates in the syllabus. Assignments must be turned in at the start of class, with your name and date, stapled, and with answers only on the fronts of pages. Homework assignment averages will count for 40 points toward your overall grade, and also be used for attendance verification. The home work grades will be determined by completeness and spot checked for accuracy.
- In order to improve student success in this course, part of your grade will depend on participation in the chemistry department tutorial services. 10 points of the overall grade (just over 1%) will be awarded for attendance of two of the tutorial sessions.
- You have one week from the time a graded assignment is returned/posted on Blackboard to ask questions about the grading. After a week, I will not change a grade.
- Letter grades will be assigned as follows: A 88 - 100%; B 76 - 87%; C 66 - 75%; D 56 - 65
- 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://www.winthrop.edu/uploadedFiles/studentconduct/StudentHandbook.pdf

Exams and Quizzes: You will need a scientific calculator (one with exponential notation, logarithms, and orders of operation) for exams and quizzes.
Use of cell phones and sharing of calculators are both strictly prohibited during exams and quizzes.

Course Withdraw: March 8 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: Information may be sent via Blackboard or the Class List Server. If you added the course late or are not receiving emails, go to http://www.winthrop.edu/technology/default.aspx?id=7081 to add yourself.
If you have any questions, call, e-mail, or see me before/after class 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. You are also responsible for any announcements/assignments posted vial blackboard or email, so you should check your email and Blackboard accounts daily.

Students with Disabilities/Need of Accommodations for Access:

Winthrop University is committed to providing access to education. If you have a condition which may adversely impact your ability to access academics and/or campus life, and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 803-323-3290, or,accessibility@winthrop.edu. Please inform me as early as possible, once you have your official notice of accommodations from the Office of Accessibility.

Academic Success Center: *Winthrop's Academic Success Center 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 10. 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.*

****This document may be adjusted as needed during the semester. The student is responsible for being aware of any changes and so should check the department website, chem.winthrop.edu, prior to every class for changes to this syllabus.*

This is a tentative schedule and will be revised as needed. Last updated on 1/9/2017

Class meeting dates:		**Text Section** Read prior to class	**Homework Problems (odd unless otherwise specified)** **Problems in red due at the beginning of class on listed date.**	**Lecture Videos (videos in red are required)** Videos may be accessed via Blackboard if links are not working	**Lecture Presentations (in OpenOffice, Powerpoint, and pdf formats)**
01/10/17		1.1-1.8	**Ch 1**.: 1, 3, 7, 11, 15, 17, 19, 25, 27, 29, 39, 41, 43, 47, 49, 51, 53, 57, 63, 67, 69, 71, 77	Algebra/exponents Ch1-Matter Ch1-Metric System Ch1-Sig. Figures Ch1-Conversions	Ch. 1, ppt, pdf
01/12/17		1.19-1.10	**Ch 1**: 20, 28, 40, 48	Ch1-Conversion Examples Ch1-Density/Temperature	
01/17/17		2.1-2.4	**Ch 2:** 1, 5, 7, 9, 17, 21, 23, 25, 31, 33, 39, 41, 45, 51, 53, 59, 61, 63, 67, 73, 81	Ch2-Atomic Structure Ch2-Isotopes	Ch. 2, ppt, pdf
01/19/17		2.5	**Ch 2**: 22, 26, 32	Ch2-Periodic Table Ch2-Average Mass Ch2-Moles Ch2-Moles Examples	
01/24/17	Exam 1				
01/26/17		3.1-3.9	**Ch 3:** 1, 3, 9, 11, 13, 17, 19, 23, 35, 73, 75, 91, 93, 97, 99, 101, 107, 109, 111	Ch3-Introduction Ch3-Quantum Numbers Ch3-Electron config Ch3-Introduction Ch3-Quantum Numbers Ch3-Electron config Ch3-El conf examples Ch3-Other notations Ch3-Periodic Trends Ch3-Per. Trend examples	Ch. 3, ppt, pdf
01/31/17		3.9-3.12			
02/02/17			**Ch 3**: 6, 20, 92, 96, 110, 120		
02/07/17		4.1-4.7	**Ch 4:** 1, 3, 7, 29, 31, 35, 37, 39, 43, 47, 53, 59, 61, 67, 71, 85, 105, 117, 121, 155	Ch4-Ionic compounds Ch4-Ionic cpds-examples Ch4-Covalent compounds Ch4-Lewis Structures Ch4-Lewis Structures-examples Ch4-electronegativity Ch4-Formal charges	Ch. 4, ppt, pdf
02/09/17		5.1-5.3	**Ch 5:** 11, 13, 19, 23, 25, 27, 31, 33, 41, 43, 47	Ch5-geometries Ch5-Polarity	Ch. 5, ppt, pdf
02/14/17		6.1-2	**Ch 6:** 1, 11, 13, 17, 19, 23, 27, 29, 33	Ch6-Intermolecular forces	Ch. 6, ppt, pdf
02/16/17	Exam 2				

02/21/17		7.1-7.4	**Ch 7:** 1, 3, 7, 11, 17, 19, 21, 23, 31, 33, 37, 39, 47, 51, 71, 79, 81, 105	Ch7-reactions Ch7-reactions-examples Ch7-balancing Ch7-balancing-examples	Ch. 7, ppt, pdf
02/23/17		7.5-7.8	**Ch 7:** 22, 34, 40	Ch7-mass percent Ch7-empirical formulas Ch7-limiting reactants Ch7-limiting reactants examples Ch7-percent yield	
02/28/17		8.1-8.4	**Ch 8:** 11, 47, 51, 53	Ch8-Molarity Ch8-Molarity examples	Ch. 8, ppt, pdf
03/02/17		9.1-9.3	**Ch 9:** 41, 47, 51, 53	Ch9-Thermochemistry Ch9-Heating curve Ch9-Specific heat Ch9-Enthalpy	Ch. 9, ppt, pdf
03/07/17		10.1-10.6	**Ch 10:** 39, 41, 47, 49, 53, 59, 61, 67, 73, 79, 95, 97	Ch9-Gas Laws	Ch. 10, ppt, pdf
03/08/17	Last day to drop full semester course				
03/09/17	Exam 3				
03/12/17 - 03/16/17	Spring Break				
03/21/17		12.1-12.5	**Ch 12:** 5, 17, 23, 25, 27, 33, 35, 37, 41, 45, 49, 59, 63	Ch12-Thermodynamics	Ch. 12, ppt, pdf
03/23/17		12.6-12.7			
03/28/17		13.1-13.3	**Ch 13:** 1, 3, 5, 7, 9, 29, 31, 35, 45, 57, 61, 63, 67	Ch13-Kinetics	Ch. 13, ppt, pdf
03/30/17		13.4-13.6			
04/04/17	Exam 4				
04/06/17		14.1-14.5	**Ch 14:** 1, 7, 11, 15, 19, 23, 25, 29, 39, 41, 51, 59, 73, 83, 85, 93, 111	Ch14-Equilibrium	Ch. 14, ppt, pdf
04/11/17		14.4-14.10			
04/13/17		15.1, 15.8	**Ch 15:** 9, 11, 15, 31, 33, 35, 53, 55, 59, 87, 91, 95	Ch15-Acids/Bases	Ch. 15, ppt, pdf
04/18/17	Exam 5				
04/20/17			Review		
04/29/17	FINAL EXAM		8:00 AM Saturday in SIMS 209 for section 004		