

CHEM 106

Fall 2018

Section 002

3 credit hours

CHEM 106: General Chemistry II
TR 9:30-10:45am Sims 209

Faculty Contact Information

Instructor: Dr. Takita F. Sumter

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Course Overview

Course Objectives: To present essential topics in general chemistry using medically relevant models. The models will teach students important topics involving chemical thermodynamics, equilibrium, and interactions while also providing an appreciation for the various ways in which chemistry transcends other disciplines (i.e. physics, biology, and psychology).

Student Learning Outcomes: Students completing this course successfully will demonstrate competence in fundamental general chemistry topics. Strong quantitative skills and the ability **to think critically and solve problems (ULC #1)**. These students will also have developed their critical thinking skills evidenced from their comprehensive and interdisciplinary understanding of the influence that chemistry has on biological phenomena.

Prerequisites/Co-requisites: CHEM 105 with a grade of "C" or better; CHEM 108 is a co-requisite.

Suggested Text: *Chemistry: an atoms-focused approach*, by Gilbert

Major Course Themes:

Fundamental Topics of General Chemistry- to understand the molecular basis of drug action.

Medical Approaches to Inflammation- Emphasis will be placed on the actions as they relate to fundamental principles of chemistry to demonstrate mechanisms of drugs commonly used to treat inflammation.

Neuroscience: The Juncture of Chemistry, Biology, and Psychology- the molecular basis of how neurotransmitters and interact with their receptors and how various drugs disrupt these interactions will be discussed.

Course Requirements

Class Preparation: While attending the lecture is important, you will not gain a total understanding of the principles presented in this course by just attending the lectures. **I have heard many students say that they knew the material, but were unable to answer the questions on the exam. Many times you will feel that you know the material, but the ultimate test of your understanding is your ability to demonstrate understanding through critical thinking on quizzes and exams. The principles in this course build on those previously covered and will require continuous review of the material.**

Pre-class assessment AND problem sets: Various exercises will be assigned to test student competencies, some that were covered in CHEM 105, required to succeed in this course. These exercises will come in the form of pre-class assessment and problem sets. Problem sets will also be assigned to prepare students for quizzes and exams. **These items are available on the course's blackboard shell so check it often.**

Quizzes: Quizzes will be given throughout the course and will most often cover the single most important topic of the previous lecture. **No makeup quizzes will be given.**

Exams: There will be three exams worth 150 points each tentatively on the dates outlined on the course schedule. **No makeup exams will be given. If you are absent on the date of a scheduled exam, the appropriate percentage of your final exam grade will be used to replaced the missed exam.**

There will be a comprehensive final exam on Friday, Dec. 7, 2018 at 11:30 am worth 350 points covering all topics from this course. You must score at least 50% of the points on this exam to pass the course. Requests to address legitimate final exam conflicts must be submitted one week prior to the last day of classes.

Grading:

Preclass Assessments/Problem Sets (10pts)	50pts.
Quizzes (5x 30pts)	150 pts.
Exams (3 x 150 pts)	450 pts.
Final Exam	350 pts.
	1000pts
Grade Assignment: A = 92-100% B+ = 88%-91.9%. B = 78%- 87% C+ = 75-77.9% C = 67%-74% D+ = 65%-66.9% D = 57%-64.9% F = 56% or lower	

Class Attendance: Required. In accordance with University policy, students must attend at least 75% of the classes to pass the course. Attendance will be considered in the case of borderline grades.

Course evaluations: Student course evaluations are managed via an online system towards the end of the semester. The information below, along with an announcement that the site is opened will be forwarded. Students will sign in with their student number (W12345678) and the **CRN: 12774**

Academic Responsibility: Winthrop University has a strict Student Conduct Code printed in the Winthrop University Student Handbook. Students should avoid any infractions such as cheating and plagiarism. Violations of Winthrop's Student Conduct Code will result in failing grade for the entire course. **Violations to this code include unauthorized use of personal electronic devices.** Details of the policy can be found online (<http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf>).

Students with Disabilities: Winthrop University is dedicated to providing access to education. If you have a disability and need accommodations, please contact the Office of Accessibility Services at 323-3290 or accessibility@winthrop.edu, as soon as possible.

General Education Program Requirements: CHEM 106 and the co-requisite CHEM 108 together fulfill four hours of general education requirement for natural sciences. Listed below are Winthrop's seven fundamental student learning outcomes for natural science courses as well as examples of how they will be fulfilled in CHEM 106 and 108. 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.
2. Able to apply the scientific methodologies of inquiry. (e.g., CHEM 108 laboratory exercises and experiments)
3. Able to discuss the strengths and limitations of science.
4. Able to demonstrate an understanding of the history of scientific discovery.
5. Able to discuss the social and ethical contexts within which science operates (e.g., exposure of humans to known carcinogens through thoughtless practices).
6. Able to communicate about scientific subjects including (lab courses only) the defense of conclusions based on one's own observations. (e.g. CHEM 108 laboratory presentations and project reports)
7. Able to discuss the application of scientific knowledge to the social sciences and to non-scientific disciplines.

Week Day	Date	Topic	Lecture Reading
Tuesday	21-Aug	Biomolecular Interactions	Ch. 5 and Ch. 6
Thursday	23-Aug	Functional Groups and Carbon	Interchapter "P"; Protein Structur- ATP Handout
Tuesday	28-Aug	Chemistry of Carbon and Functional groups for Biomolecules	Ch. 19, Ch. 20
Thursday	30-Aug	Components of the Cell Membrane	"Phospholipids" and "Phosphate Heads" Handout
Tuesday	4-Sep	NO CLASS MEETING-ONLINE ASSIGNMENTS	"Phospholipids" and "Phosphate Heads" Handout
Thursday	6-Sep	Water as a cellular solvent: Aqueous Equilibria	Ch. 8, 15
Tuesday	11-Sep	Acid Base Chemistry of Buffers	Ch. 8, 15
Thursday	13-Sep	Acid Base Chemistry of Amino Acids	Ch.15, 20
Tuesday	18-Sep	Exam I	All Topics through Amino Acids
Thursday	20-Sep	Protein Primary Structure	Ch. 20; Prot. Struct/ATP
Tuesday	25-Sep	Introduction to Proteins and Their Structure	Ch. 20
Thursday	27-Sep	Protein Structure (cont'd)	"Biological Polymers" Interchapter
Tuesday	2-Oct	Chemical Kinetics	Ch. 13
Thursday	4-Oct	Enzyme Kinetics	
Tuesday	9-Oct	Enzyme Inhibition	Protein Function Handout
Thursday	11-Oct	COX and NSAIDS: A case study of enzymes	COX in a Crystal Ball handout
Tuesday	16-Oct	cont'd	
Thursday	18-Oct	Exam II	All topics through COX
Tuesday	23-Oct	Nuclear Receptors/Drug Receptor Interactions	Protein Function Handout
Thursday	25-Oct	cont'd	cont'd
Tuesday	30-Oct	Neurotransmission	Neurotransmission handout
Thursday	1-Nov	Synapse, Neurotransmitters, and Neurotransmission	Neurotransmission handout
Tuesday	6-Nov	Election Day	
Thursday	8-Nov	Electrochemistry and Neurochemistry	Ch. 17
	13-Nov	Electrochemistry and Neurochemistry	Interchapter "U"
Thursday	15-Nov	Electrochemistry and Neurochemistry	Diffusion and Transport across cell membranes
Tuesday	20-Nov	EXAM III	All topics Through Electrochemistry
Thursday	22-Nov	Thanksgiving Break	
Tuesday	27-Nov	cont'd	
Thursday	29-Nov	Review	
Friday	7-Dec	Cumulative Final Exam (11:30 am)	

*Note: This course schedule is tentative. The instructor will notify students of changes verbally or via email