

Fall 2020

CHEM 125-H01: General Chemistry I

Michael Eberhart

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Chemistry: *Fall 2020 Course Syllabus*

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science (CES) takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: Chem 125 - General Chemistry - Honors

The first semester of a two-semester sequence in chemistry. Introduces the basic concepts of chemistry, including stoichiometry, chemical reactions and bonding, electronic and molecular structure, gases, and thermochemistry. The honors course roughly parallels Chem 125, but is more rigorous and comprehensive than the regular Chem 125 course.

Number of Credits: 3

Co-requisite: Math 110. Students are expected to have a strong background in algebra. Application of calculus will not be required to solve problems in the course, but concurrent enrollment in calculus I or higher is strongly recommended to remain on track for students pursuing a degree in the physical sciences or engineering.

Course-Section and Instructor:

Course-Section	Instructor
General Chemistry I Chemistry 125-Honors, section H01	Prof. Michael Eberhart

Office Hours: Thursdays from 1:00 PM-2:00 PM and other times by appointment. Office hours will be held via Webex or Google Meet. In person office hours may be available by appointment when conditions permit.

Canvas: Important course information including homework assignments/answer keys, exam answer keys, grades, and details about office hours will be posted.

Required Textbook:

Title	Chemical Principles
Author	Stephen Zumdahl and Donald DeCoste
Edition	8 th
Publisher	Cengage Learning
ISBN #	9781305581982

University-wide Withdrawal Date: The last day to withdraw with a W is Monday, November 9, 2020. It will be strictly enforced.

Learning Outcomes:

- Understand dimensional analysis to convert between units
- Be able to balance chemical equations, determine limiting reactants, and calculate yield
- Name simple compounds
- Explain periodic trends
- Explain atomic structure
- Determine elemental composition of compounds by mass
- Explain Acid-Base and Redox reactions
- Use the ideal gas law to relate volume, mass, temperature, and molar quantities
- Explain and predict how the properties of real gasses differ from ideal gases
- Calculate basic thermodynamic properties of chemical processes
- Explain atomic emission spectra for hydrogenic orbitals
- Use the particle in a box model
- Explain electronic configurations of atoms and ions
- Predict bond and molecular polarity
- Draw correct Lewis structures
- Predict geometry using the VSEPR model
- Use molecular orbital theory to describe bonding in diatomic molecules
- Explain features of electronic, vibrational, rotational, and NMR spectroscopy
- Relate spectroscopic observations to structure
- Understand colligative properties of solutions

POLICIES

All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework	10%
Problem Sets	20%
Midterm Exam I	15%
Midterm Exam II	15%
Midterm Exam III	15%
Final Exam	25%

Your final letter grade in this course will be based on the following tentative curve:

A	90-100%	C	70-76%
B+	87-89%	D	60-69%
B	80-86%	F	<60%
C+	77-79%		

The percentage scores required to earn a particular letter grade will not be increased.

Attendance Policy: Attendance at classes will be recorded and is **mandatory**. Each class is a learning experience that cannot be replicated through simply “getting the notes.”

Homework and Problem Sets: Homework is an expectation of the course. Homework problems will be assigned and collected regularly. The week before each exam, a more comprehensive problem set will be distributed through Canvas and is intended as exam preparation.

Exams: There will be three midterm exams held during the semester and one comprehensive final exam. The exams occur during the common exam time period set by the registrar. Exams and other assessments will be submitted electronically. The following exam periods are tentative and therefore possibly subject to change:

Midterm Exam I	Monday, September 28, 4:30-5:45 PM
Midterm Exam II	Monday, October 26, 4:30-5:45 PM
Midterm Exam III	Monday, November 23, 4:30-5:45 PM
Final Exam Period	December 15 - December 21

The final exam will test your knowledge of all the course material taught in the entire course.

Makeup Exam Policy: There will normally be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

ADDITIONAL RESOURCES

Chemistry Tutoring Center: Located in the Central King Building, Lower Level, Rm. G12. Hours of operation are Monday - Friday 10:00 am - 6:00 pm. For further information please click [here](#).

Accommodation of Disabilities: Office of Accessibility Resources and Services (*formerly known as Disability Support Services*) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- <http://www5.njit.edu/studentuccess/disability-support-services/>

Important Dates See: Fall 2020 Academic Calendar, Registrar
<https://www5.njit.edu/registrar/fall-2020-academic-calendar/>

Date	Day	Event
September 1	T	First Day of Classes
September 5	S	Saturday Classes Begin
September 7	M	Labor Day
September 8	T	Monday Classes Meet Last Day to Add/Drop a Class Last Day for 100% Refund, Full or Partial Withdrawal
September 9	W	W Grades Posted for Course Withdrawals

September 14	M	Last Day for 90% Refund, Full or Partial Withdrawal No Refund for Partial Withdrawal after this date
September 28	M	Last Day for 50% Refund, Full Withdrawal
October 19	M	Last Day for 25% Refund, Full Withdrawal
November 9	M	Last Day to Withdraw
November 25	W	Friday Classes Meet
November 26	R	Thanksgiving Recess Begins
November 29	Su	Thanksgiving Recess Ends
December 10	R	Last Day of Classes
December 11	F	Reading Day 1
December 14	M	Reading Day 2
December 15	T	Final Exams Begin
December 21	M	Final Exams End
December 23	W	Final Grades Due

Course Outline

Lecture	Section	Topic	Assignment
1 (9/1)		Introduction, measurements, dimensional analysis	
2 (9/3)		Measurements, dimensional analysis	
3 (9/8)	Chapter 2	Atoms, Molecules, and Ions	
4 (9/10)	Chapter 2	Atoms, Molecules, and Ions	
5 (9/15)	Chapter 3	Stoichiometry	
6 (9/17)	Chapter 3	Stoichiometry	
7 (9/22)	Chapter 4	Types of Chemical Reactions and Solution Stoichiometry	
8 (9/24)	Chapter 4	Types of Chemical Reactions and Solution Stoichiometry	Problem Set 1 due
(9/28)		Midterm Exam I ----Monday----	
9 (9/29)	Chapter 5	Gases	
10 (10/1)	Chapter 5	Gases	
11 (10/6)	Chapter 9	Energy, Enthalpy, and Thermochemistry	
12 (10/8)	Chapter 9	Energy, Enthalpy, and Thermochemistry	
13 (10/13)	Chapter 12	Quantum Mechanics and Atomic Theory	
14 (10/15)	Chapter 12	Quantum Mechanics and Atomic Theory	
15 (10/20)	Chapter 13	Bonding	
16 (10/22)	Chapter 13	Bonding	Problem Set 2 due
-- (10/26)		Midterm Exam II ----Monday----	
17 (10/27)	Chapter 14	Covalent Bonding: Orbitals	

18 (10/29)	Chapter 14	Molecular Spectroscopy	
19 (11/3)	Chapter 16	Liquids and Solids	
20 (11/5)	Chapter 16	Liquids and Solids	
21 (11/10)	Chapter 17	Properties of Solutions	
22 (11/12)	Chapter 17	Properties of Solutions	
23 (11/17)	Chapter 18	The Representative Elements	
24 (11/19)	Chapter 18	The Representative Elements	Problem Set 3 due
-- (11/23)		Midterm Exam III ----Monday----	
25 (11/24)	Chapter 19	Introduction to Transition Metals and Coordination Chemistry	
-- (11/26)		No Class, Thanksgiving Holiday	
26 (12/1)		Special Topics	
27 (12/3)		Special Topics	
28 (12/8)		Special Topics	
29 (12/10)		Special Topics	

*Updated by Genti' Price, Michael Eberhart -
 August, 2020
 Department of Chemistry & Environmental Sciences (CES)
 Course Syllabus, Fall 2020*
