Fall 2020

CHEM 125-021: General Chemistry I

Christopher Desantis

NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

CHEM 125: General Chemistry 1

Fall 2020 Course Syllabus

The shift to remote and converged teaching due to the COVID-19 pandemic has required that both instructors and students make changes to their normal working protocols for courses. Students are asked to practice extra care and attention in regard to academic honesty, with the understanding that all cases of plagiarism, cheating, multiple submission, and unauthorized collaboration are subject to penalty. Students must properly cite and attribute all sources used for papers and assignments. Students may not collaborate on exams or assignments, directly or through virtual consultation, unless the instructor gives specific permission to do so. Posting an exam, assignment, or answers to them on an online forum (before, during, or after the due date), in addition to consulting posted materials, constitutes a violation of the university's Honesty policy. Likewise, unauthorized use of live assistance websites, including seeking "expert" help for specific questions during an exam, can be construed as a violation of the honesty policy.

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: ***http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.***

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. ***Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.*** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu"*

COURSE INFORMATION

Course Description: Chem 125
Number of Credits: 3
Corequisites: Math 110 or equivalent
Course-Section and Instructors

Course-Section	Instructor
Chem 125	Dr. Christopher DeSantis

Email: christopher.a.desantis@njit.edu
Office: Tiernan Hall B006 (basement)

Lecture:
Sections 19, 21, and 23: Friday 2:30 - 3:50pm CTR BALL B
Section 29: Wednesday 9:00 – 10:20AM CKB 217

Recitations:
Section 19: Monday 12:30 – 1:50PM CKB 217
Section 21: Monday 2:30 – 3:50PM CKB 204
Section 23: Tuesday 4:00 – 5:20PM CKB 303
Section 29: Friday 9:00 – 10:20AM CKB 217

Office Hours: In Webex Room

Tuesdays: 2PM-3PM

Wednesday: 10:30-11:30AM

Also available by appointment. In-Person meetings also available by appointment.

Webpage: The course website is available through Canvas, which can be accessed via the njit.edu. Please email me immediately if you cannot access the class site. All materials including lecture summaries, any PowerPoint slides, and other documents will be posted on the class site. Please check the site frequently for new materials and announcements. All grades for this course will be posted to Canvas on a regular basis. You are responsible for all updates posted to Canvas, and if you find any mistakes in content or grading, or you need help accessing these materials, please contact your instructor as soon as possible.

Required Textbook:

Title	Chemistry, A Molecular Approach
Author	Nivaldo J. Tro
Edition	Fifth
Publisher	Pearson
ISBN #	ISBN-13: 978-0134874371

University-wide Withdrawal Date: The last day to withdraw with a **W** is Monday, November 9, 2020.

Learning Outcomes:

1. **Learn measurement units and perform unit conversions systematically using dimensional analysis or multiplication by one**
2. **Explain atomic structure and determine average atomic mass.**
3. **Learn to use periodic table to predict charges on atoms.**
4. **Understand mole concept: convert mass into moles and vice versa**
5. **Write chemical formulas of compounds using the periodic table and name ions and simple compounds.**
6. **Calculate mass of molecules, and mass % of individual atoms in compounds**
7. **Calculate moles, molecular and empirical formula of a compound from basic principles using proper unit conversions**
8. **Balance chemical equations**
9. **Identify various types of chemical reactions and apply the concept of limiting reagent to calculate percentage yield of products in different reaction types.**
10. **Define solute, solvent and apply mole concept in aqueous solutions.**
11. **Determine oxidation states of elements in compounds**
12. **Describe acid-base, precipitation and redox reactions in solution**
13. **Understand Kinetic model of gases and apply various gas laws in problem solving.**
14. **Apply first law of thermodynamics to chemical problems and calculate the energy changes in chemical reactions**
15. **Explain the quantum mechanical basis for the sub-structure of the atom**
16. **Write the electronic configuration for the elements in the periodic table and describe trends in periodic properties**
17. **Draw the Lewis dot structures for simple molecules and exceptions to octet rule**
18. **Discuss electronegativity and bond polarity**
19. **Use VSEPR to predict shapes of molecules and whether a molecule will have a dipole moment**
20. **Identify sigma and pi bonds and explain the hybridization of the molecules**
21. **Explain intermolecular force and the differences in bonding patterns between solids liquids and gases**
22. **Describe differences in basic crystalline shapes**
23. **Determine edge length and density of simple crystalline shapes.**
24. **Predict changes in freezing point, elevation in boiling point and osmotic pressure when a solute dissolves in a pure solvent**

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.

In addition, obtaining course materials such as past exams or solutions to homework and/or class assignments from external sources constitutes as cheating. The official Student's Solutions Guide is exempt. Posting of course materials on external websites without the approval of the instructor violates intellectual property laws and hence strictly forbidden**.** Any student caught cheating on homework will be assessed a penalty of 20 points, in addition to a grade of zero for the given homework assignment.

Students are encouraged to seek help from their Instructors during office hours.

Grading Policy: The final grade in this course will be determined by a point total based on the following:

Homework	200
Class Participation (122 recitation + 28 lecture)	150
Common Exam I, Sep 28	175
Common Exam II, October 26	175
Final Exam	300
Total points	1000

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

A	>835	**C**	600-659
B+	775-834	**D**	550-599
B	710-774	**F**	< 550
C+	660-709		

You must maintain an average of 35%, which is 228 points in the common exams and finals to be considered for a grade of D or higher. You will receive an F even if you have adequate point total without this requirement.

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."

LECTURE (CONVERGED): A computer and calculator are required for all lectures. Students are expected to come to lecture after having reviewed the pre-recorded lecture notes available in Canvas. Instruction will be offered in a Converged mode, however a laptop will be required for all classes. We will be doing a lot of problem -solving, so a paper notebook where you can do problems is highly recommended. Polls will be administered during lecture. Each lecture participation is worth 2 points. Students must answer ½ of the poll questions to earn that day's participation points.

If your computer malfunctions and you are unable to attend class either in person or remotely, you are required to inform the instructor, via e-mail the **same day**. Failure to notify the instructor will result in loss of points for that day.

RECITATION (SECOND LECTURE PERIOD) CONVERGED: There will be 14 worksheets worth 10 points each. Each recitation, the students will be given a worksheet to solve with their group. You will be given adequate time to complete the worksheets and upload your work. These worksheets are essential for helping you learn and are worth points. So please take the time to do the work neatly and upload them in the space provided in CANVAS. Students who miss a recitation for a valid reason must still make up the worksheet to get credit. Each student will earn the grade for their own work and must upload their own work.

CONVERGED LEARNING RESPONSIBILITY: The shift to remote and converged teaching due to the COVID-19 pandemic has required that both instructors and students make changes to their normal working protocols for courses. Students are asked to practice extra care and attention in regard to academic honesty, with the understanding that all cases of plagiarism, cheating, multiple submission, and unauthorized collaboration are subject to penalty. Students may not collaborate on exams or assignments, directly or through virtual

consultation, unless the instructor gives specific permission to do so. Posting an exam, assignment, or answers to them on an online forum (before, during, or after the due date), in addition to consulting posted materials, constitutes a violation of the university's Honesty policy. Likewise, unauthorized use of live assistance websites, including seeking "expert" help for specific questions during an exam, can be construed as a violation of the honesty policy. All students should be familiar with the NJIT integrity code . ***http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf***.

In addition to adhering to the NJIT Integrity statement, converged learning also places a significant amount of responsibility on you. Please review the email sent by the registrar for detailed instructions on classroom assignment and dates when you will be on campus. This can be accessed via **Back2Classroom** app. More details can be found at:

https://back2classroom.njit.edu/getting-started-students

HOMEWORK POLICY:

Your Homework will be online and accessed via CANVAS. The homework is to test your understanding of the material being taught. This homework will build on the classroom content and enhance your understanding of the material. This homework will also be good preparation for the common exams.

All homework is very important. However, it is absolutely important that you aim to get > 90% in all your homework to get the most benefit.

Each homework assignment has it due date. In addition, Moodle has a calendar with due dates. **ALL HOMEWORK MUST BE DONE ON TIME. There is no credit for late homework.** DO NOT WAIT TO THE LAST MINUTE TO DO YOUR HOMEWORK. ONLINE SYSTEMS ARE NOT 100% RELIABLE AND UNEXPECTED EVENTS MAY OCCUR. IN GENERAL, THERE IS NO LATE HOMEWORK AND MOODLE BEING DOWN IS NOT A VALID EXCUSE. PLAN TO FINISH YOUR HOMEWORK AT LEAST ONE DAY BEFORE IT IS DUE.

EXAMS: There will be two midterm exams held in class during the semester and one comprehensive final exam. The following exam periods are tentative and therefore possibly subject to change:

Common Exam I	**Monday 4:30 - 5:45pm – 09/28/2020**
Common Exam II	**Monday 4:30 - 5:45pm – 10/26/2020**
Reading Days	**Dec 11 and Dec 14th**
Final Exam Period	**Dec 15th – Dec 21st**

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

ADMINISTRATION OF EXAMS:

The Common and Final Exams will be administered in the using the RESPONDUS browser with Webcam. **This browser is available in Canvas**

During the exam, you have to adopt the following behaviors

1. No cell phones anywhere near the exam-- any indication of cell phone presence (a ring tone, vibration, music, will result in a point penalty)
2. No Talking to family members.
3. No Covering of face (either with clothing or hand)
4. No Moving out of frame.
5.. No Listening to music.

Setting up the camera so that the camera's view is not completely on student and workspace.

To protect the test's integrity, anyone found to violate any of the rules (2-6) of an exam or have facial recognition for less than 50% of the exam time will be docked 10 points for each violation from their exam score.

We understand these are difficult times and it is natural to move around when taking an exam in the comfort of your home. We must remind you that this is a high stakes exam and must be treated as such. Please observe all exam rules as if you were taking the exam in person.

TEST GRADING ERROR. Tests are returned in recitations following the test. If you believe there is an error, you have until the Thursday following the test to submit a test for regrading. You must write a very brief

description of the problem on the back of the test. (The answer key will be provided in Canvas. You should always learn from your mistakes and go over the answer key.)
ALL ERRORS NEED TO BE BROUGHT TO THE INSTRUCTOR'S ATTENTION WHEN THEY OCCUR. DO NOT WAIT UNTIL THE END OF THE SEMESTER

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. **One *cumulative make-up examination*** will be permitted at the end of the semester if there is an acceptable and substantial reason. A grade of zero will be given for a second missed examination independent of reason. ***Tentative date of the makeup exam is during the week of Dec 7 th.***

HOW TO SUCCEED IN THIS COURSE:

You are responsible for utilizing the resources provided like pre-recorded lectures to help yourself learn. You will benefit from the lecture and recitation only if you come prepared to class. Please plan to spend at least 6-9 hours each week outside the lecture/recitation period for this class.

All instructors will provide their availability for office hours where you can go for extra help. In addition, the Chemistry tutoring center will be a useful resource where you can get help from peers. On a weekly basis you need to plan for:

a) Time to listen to pre-recorded lectures (before the class) and review the textbook chapter
b) Prepare questions to ask the professor during class
c) Review material and come prepared to do the worksheets
d) Time to do the online homework

ADDITIONAL RESOURCES

Chemistry Tutoring Center: Located in the Central King Building, Lower Level, Rm. G12. Students can get help from peer tutors on a "walk-in" basis. There is no private tutoring available, however if the center is not too busy, you may be able to get more personal attention. In this peer tutoring model, tutors are taught to encourage interaction among students to promote learning. In addition, there will be limited tutoring available online as well Hours of operation are between Monday – Friday 10:00 am - 6:00 pm, either virtually or in-person

Accommodation of Disabilities: **O**ffice of **A**ccessibility **R**esources and **S**ervices (***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/studentsuccess/disability-support-services/

IMPORTANT DATES: (See: Fall 2020 Academic Calendar, Registrar)

D	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

Week	Outcomes	Topic	Homework
1	1	Chapter 1: Matter, Measurement and problem solving	Warm up Basic HW Chapter 1 homework
2	2,3,4	Chapter 2: Atoms and Elements	Chapter 2 homework
3	4,5,6,7	Chapter 3: Molecules and Compounds	Chapter 3 homework
4	8,9	Chapter 4: Chemical Reactions and Chemical Quantities	Chapter 4 Homework
5	10, 11, 12	Chapter 5: Introduction to Solutions and Aqueous Reactions	Chapter 5 Homework
6	13	Chapter 6: Gases	Chapter 6 Homework
7	14	Chapter 7: Thermochemistry	Chapter 7 Homework
		EXAM 1: Chapters 1- 3	

8	15	Chapter 8: The Quantum Mechanical Model of the Atom	Chapter 8 Homework
9	16,17	Chapter 9: Periodic Properties of the Elements	Chapter 9 Homework
10	17, 18, 19	Chapter 10: Chemical Bonding I: The Lewis Model	Chapter 10 Homework
11	18, 19, 20	Chapter 11: Molecular shapes, Valence Bond Theory and Molecular Orbital Theory	Chapter 11 Homework
		EXAM 2: Chapters 4-8	
12	21	Chapter 12: Liquids, Solids and Intermolecular Forces	Chapter 12 Homework
13	22, 23	Chapter 13: Solids and Modern Materials	Chapter 13 Homework
14	24	Chapter 14: Solutions	Chapter 14 Homework
15	1 - 20	**FINAL EXAM Review**	Review