

## CHEM 125

### Fall 2025 Course Syllabus

*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 to achieve. 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 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](mailto:dos@njit.edu)*

*This course expects you to work without artificial intelligence (AI) assistance in order to better develop your skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance.*

*You 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. You must properly cite and attribute all sources used for papers and assignments. You may not collaborate on exams or assignments, directly or through virtual consultation, unless I give 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.*

#### COURSE INFORMATION

**Course Description:** CHEM-125, The first semester of a two-semester sequence in chemistry. Introduces the basic concepts of chemistry, including chemical reactions and bonding, electronic and molecular structure, gases, and thermochemistry.

**Number of Credits:** 3

**Corequisites:** Math 110 or equivalent

**Course-Section and Instructors**

Course-Section	Instructor	Meeting Times		
007	DeSantis	Wednesday Thursday	1-2:20PM 8:30-9:50AM	Tiernan Lecture Hall 2 FMH 306
009	DeSantis	Tuesday Wednesday	2:30-3:50PM 1-2:20PM	FMH 213 Tiernan Lecture Hall 2
011	DeSantis	Tuesday Wednesday	11:30AM-12:50PM 1-2:20PM	FMH 213 Tiernan Lecture Hall 2

**Office Hours: Tiernan B006 (basement). Wednesday 3:30-5:30PM and Thursday 1-3PM.**

**Also by appointment.**

**EMAIL: [cdesanti@njit.edu](mailto:cdesanti@njit.edu) or [christopher.a.desantis@njit.edu](mailto:christopher.a.desantis@njit.edu)**

**Webpage:** The course website is available through Canvas, which can be accessed via [canvas.njit.edu](https://canvas.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:**

<b>Title</b>	Chemistry: Atoms First 2e
<b>Author</b>	openstax.org
<b>Edition</b>	Second
<b>Publisher</b>	OpenStax
<b>ISBN #</b>	<b>Color:</b> ISBN-13: 978-1-947172-64-7 <b>Black and White:</b> ISBN-13: 978-1-59399-579-9 <b>Digital PDF:</b> ISBN-13: 978-1-947172-63-0

**Suggested Material:** Free solution manuals can be found using this url: [openstax.org](https://openstax.org)

**University-wide withdrawal date:** The last day to withdraw with a **W** is Monday, November 10<sup>th</sup>, 2025.

**STUDENT RESOURCES FOR SUPPORT AND LEARNING**

**Chemistry Tutoring Center:** Located in the Central King Building, Lower Level, Room G12. You 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 from Monday—Friday 10:00 am—6:00 pm*, either virtually or in-person.

**Accommodation for Accessibility Issues:** Office of Accessibility Resources and Services (**OARS**, formerly known as Disability Support Services) offers long term and temporary accommodations for undergraduate, graduate, and visiting students at NJIT. See <https://www.njit.edu/studentsuccess/node/5> to learn more about their services.

If you are in need of accommodations due to a documented special needs, please contact the Office of Accessibility Resources and Services 973-596-5417 or via email [oars@njit.edu](mailto:oars@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 is required to receive accommodations on assignments or exams. Eligible students requiring special conditions for exams must fill out an [OARS forms](#) stating the date and time of the exam. It is advisable for eligible students to fill out forms for the two common exams the first week of classes

**Please request all exams that must be administered by OARS by the end of the first week of class. If accommodations are not requested in a timely manner, your request will be denied.**

**Mental Health and Well-being:** NJIT is committed to the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Center for Counseling and Psychological Services (c-CAPS) at <https://www.njit.edu/counseling/> or by calling the c CAPS office at 973-596-3414. If you need support and information about options and resources, please also

reach out to the Office of the Dean of Students at <https://www.njit.edu/dos/>

**Learning Outcomes – You should be able to:**

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

**POLICIES**

**You 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	150
Class Participation (recitation 140 points + 35 points class Participation + 5 points syllabus quiz)	180
Weekly Lecture Quizzes	70
Exam I	100
Exam II	100
Exam III	100
Final Exam	300
<b>Total points</b>	<b>1000</b>

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 234 points in the common exams, quizzes, 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.**

**IN CLASS EXPECTATIONS:** The classroom is meant to be an inclusive and respectful environment where all students can feel comfortable expressing their ideas. Therefore, please treat the classroom as a professional environment. It is the job of everyone in the classroom to be respectful, use appropriate language, and behave appropriately. Discrimination or mistreatment of any kind for any reason will not be tolerated and will be reported to the Dean of Students.

This course is meant to be challenging and I will work to challenge you in your knowledge of chemistry and its application in problem solving. It's okay to make errors if you learn from them. Learn from your mistakes and get help when you need it from me or the tutoring center.

**ATTENDANCE POLICY:** Attendance to both lecture and recitation classes will be recorded and is **mandatory**. Each class is a learning experience that cannot be replicated through simply "getting the notes." This is also a highly compacted course and even one absence may cause a steep drop in course performance. Absences for unavoidable legitimate reasons will be permitted upon presentation of appropriate supporting documentation to the Dean of Students. During lectures, you will be tasked with answering polled questions.

**LECTURE (IN PERSON):** A computer and scientific (non-graphing, non-programmable) calculator are required for all lectures. You are expected to come to lecture after having reviewed the lecture notes available in Canvas. Instruction will be offered *in person* unless the University mandates virtual instruction, so assume *in person attendance is required* for all the classes. A laptop/tablet/phone with internet capability is required for all classes as I will be presenting poll questions to you for participation points and there will be an end of lecture quiz each week on Canvas. A lot of problem-solving is done during class, so a notebook where you can do problems by hand is highly recommended.

At the end of each lecture a 1-2 question quiz will be given in class lasting approximately 10 minutes. You must have a device capable of running Respondus Lockdown Browser in order to take the quiz. You will submit your answers to the quiz in canvas and then submit an image of your work for grading. Each quiz is worth 5 points. 2.5 points will be awarded for the correct answer and 2.5 points will be awarded for the proper work.

If your technology malfunctions and you are unable to participate in polling, then send email to your instructor explaining the problem **immediately** or the **same day** to receive participation points. Please include your name, the course number and section on your email. Failure to notify the instructor properly or in a timely manner will result in loss of participation points for that day.

**POLLING IN CLASSROOM:** In order to gauge your comprehension, encourage participation, and track attendance I will use using Poll Everywhere. When creating your profile, please use your name and NJIT email as it appears on the class roster. I will be using this app to assign grades so having the correct name and email is vital to getting the points you earned!

**CLASS RECORDINGS:** Class sessions may be recorded by me so you can review them in the future. These recordings shall only be used as an educational resource and are not to be distributed or used outside of this class. Information on how to access recorded lectures will be made available. Any recordings that contain identifiable information about students will not be used beyond this semester.

**CLASS RECORDING ETIQUETTE:** You are expected to respect their fellow students' privacy and freedom to learn without disruption. You are not allowed to capture or reproduce anyone's name, image, or voice without permission.

You must be polite and respectful in the online chat. Informal chat is okay, but typing is restricted to things that one would say out loud in front of the entire class. Students must always conduct themselves on their webcam video as they would in person in a classroom.

**RECITATION (SECOND LECTURE PERIOD) IN PERSON:** For recitation, you will be given a worksheet to solve. You will be given adequate time to complete the worksheets and upload your work and enter your answers in Canvas. 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. If you miss a recitation for a valid reason must still make up the worksheet to get credit.

The questions in the worksheets are to be worked on in your group and you must show all work for all questions. If the worksheets are not completed by the end of class, they may be completed at home and are due when recitation starts the next week. Answers will be graded in Canvas as a quiz and be worth 10 points in total and a file containing your work will be uploaded. You must show all work! Any quizzes entered without the work or missing any work in their upload will be reduced by 50%. You will have 2 attempts on the worksheet. If you would like a 3rd attempt, you must complete the worksheet with Dr. DeSantis in office hours. At the end of each recitation, students will be required to complete a “Critical Information Questionnaire” (CIQ) short answer survey which will be worth 1 pts each in Canvas. The purpose of the CIQ is to provide a way for students to give feedback and alert the professor of an items which may need further clarification or to provide the professor with an understanding of what works best for students to maximize learning. “Critical Information Questionnaire” survey must be completed by 11:59PM on the same day as recitation. CIQs with incomplete or low quality answers will not receive credit.

**HOMEWORK POLICY:** Homework is 100% 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. To maximize your ability to learn through homework each assignment allows multiple attempts. It is important that you aim to get > 90% in all your homework to get the most benefit.

Each homework assignment has its due date. In addition, Canvas has a calendar with due dates. **ALL HOMEWORK MUST BE DONE ON TIME. For each day homework is submitted after the due date, the maximum achievable points will be deducted 25% (2.5 points). By the end of second day, you can only earn up to 5 points (50% deduction). After the fourth day, you won't be able to earn any points (100% deduction).**

**Unexpected events**, like Canvas server being down, may occur but they are **not** considered **valid excuses** for missing a due date. Only the excuses that are validated via the Dean of Students Office will be accepted.

**Weekly Quizzes:** A quiz will occur weekly on lecture day worth 5 points to ensure you are engaged with the lecture and to test you on your new knowledge. You must bring a device to class that is capable of running Respondus lockdown browser. The quiz will cover the material covered that day in lecture, therefore it is vital that you pay attention that day in class. Starting on week 2, 2 questions will be presented and you will have 5-10 minutes to complete them.

You must work individually to complete the quiz in Respondus lockdown browser. You must submit the quiz and your work in separate assignments. Each question will be worth 2 points and the work is worth 1 point. If no work is presented for the problems, you will receive a zero on that question regardless of a correct answer.

The quiz must be completed in class and will be password locked so ensure completion in the lecture time. If you were to give the password to a classmate who is not in attendance that day, you will both receive a zero and be reported to the Dean of Students for cheating.

**EXAMS:** There will be three midterm (Common) exams and one comprehensive final exam. Common Exams are held on Mondays during the common hour. They start at 4:15PM in assigned rooms (TBD). Plan to be in your seats by 4:00PM

Common Exam I	10/20/2025
Common Exam II	11/17/2025

Common Exam III	12/8/2025
Final Exam Period	TBD

The final exam will be a cumulative exam on chapters 1-11.

**ADMINISTRATION OF EXAMS:** The Common and Final Exams will be administered in person unless University Policies dictate otherwise.

Students may only use scientific (non-programmable, non-graphing) calculators on exams and #2 pencil. The student will also be asked to show a photo-ID. No cell phones, tablets, other computers, smartwatches, or anything else which can access the internet should be anywhere near the exam-- any indication of cell phone, headphones or smart device presence (a ring tone, vibration, music, or a visible phone) will result in a point penalty or a zero on the exam. Talking to anyone during the exam is not permitted.

**During the exam, you have to adopt the following behaviors:**

1. No cell phones, tablets, other computers, headphones, smartwatches, or anything else which can access the internet should be anywhere near the exam-- any indication of cell phone presence (a ring tone, vibration, music, or a visible phone) will result in a point penalty.
2. Not talking to anyone.
3. No listening to music or having headphones/earbuds on.
4. No smart devices such as smartphones, smartwatches, or smartglasses may be on your person.

**To protect the test's integrity, anyone found to violate any of the rules (1-4) of an exam will be docked 10 points for each violation from their exam score or be given a zero.**

**TEST GRADING ERROR.** Test scores will be available in Canvas roughly 2 weeks after the test. If you wish to go over your exam, arrange to meet your instructor during office hours. If you believe there is an error, you have one week after scores are posted to discuss the error with your instructor during office hours.

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 you have a legitimate reason for missing a quiz or exam, you 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. You 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.

**Using the Respondus LockDown Browser and a Webcam for Online Exams**

Respondus LockDown Browser is a locked browser that prevents you from printing, copying, going to another URL, or accessing other applications during a quiz or exam. If a Canvas quiz or exam requires that LockDown Browser be used, you will not be able to take the assessment with a standard web browser. The LockDown Browser with a webcam (Respondus Monitor) will record you during an online exam.

The webcam can be built into your computer or it can be a separate unit that plugs in with a USB cable. Watch this [short video](#) to get a basic understanding of LockDown Browser and the webcam feature. A student [Quick Start Guide \(PDF\)](#) is also available.

1. Download and install LockDown Browser from this link:  
<http://www.respondus.com/lockdown/download.php?id=264548414>
2. Once your download has finished, locate the "LockDown Browser" shortcut on the desktop and double-click it. (For Mac users, launch "LockDown Browser" from the Applications folder.)
3. You will be brought to the Canvas or Moodle login page within the LockDown Browser. If you are in Moodle, click "Login with your UCID" to log in with your NJIT UCID and password and then click Login.
4. Under "My courses," click on the course in which you have to take the exam that requires the LockDown Browser.

5. After you enter the course, find the exam and click on it.
6. A confirmation prompt will appear. Click the "Start attempt" button. Once a quiz has been started with LockDown Browser, you cannot exit until the Submit all and finish button is clicked.
7. If you are required to use a webcam (Respondus Monitor), you will be prompted to complete a Webcam Check and other Startup Sequence steps.

#### **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 by looking through the slides or watching the videos provided by your instructor. 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 recitation problems
- d) Time to do the online homework and textbook problems
- e) Work on the Review Packets

#### **IMPORTANT DATES:** (See [Fall 2025 Academic Calendar](#))

Sept	1	Labor Day, University Closed
Sept	2	First Day of Classes
Sept	8	Last Day to Add/Drop a Class
Sept	8	Last Day for 100% Refund, Full or Partial Withdrawal
Sept	9	W Grades Posted for Course Withdrawals
Sept	15	Last Day for 90% Refund, Full or Partial Withdrawal - No Refund for Partial Withdrawal after this date
Sept	29	Last Day for 50% Refund, Full Withdrawal
Oct	2	Wellness Day
Oct	20	Last Day for 25% Refund, Full Withdrawal

Nov	10	Last Day to Withdraw from Classes
Nov	25	Thursday Classes Meet
Nov	26	Friday Classes Meet
Nov	27	Thanksgiving Recess Begins. No Classes
Nov	30	Thanksgiving Recess Ends
Dec	11	Last Day of Classes
Dec	12	Reading Day
Dec	13	Saturday Classes Meet
Dec	14	Final Exams Begin
Dec	20	Final Exams End
Dec	22	Final Grades Due

### Course Outline

Week	Outcomes	Topic	Homework
1 9/2-9/8	1	Chapter 1	Warm up Basic HW Chapter 1 HW Recitation #1
2 9/9-9/15	2,4,5,7	Chapter 2	Chapter 2 HW Recitation #2
3 9/16-9/22	3,15,16	Chapter 3	Chapter 3 HW -- part 1 Recitation #3
4 9/23-9/29	3,15,16	Chapter 3	Chapter 3 HW – part 2 Recitation #4
5 9/30-10/6	5,17,18,19	Chapter 4	Chapter 4 HW – part 1 Recitation #5

6 10/7-10/13	5,17,18,19	Chapter 4	Chapter 4 HW – part 2 Recitation #6
7 10/14 – 10/20	20	Chapter 5	Chapter 5 HW Recitation #7
10/20		<b>EXAM 1: Chapters 1-4</b>	
8 10/21 – 10/27	6,7	Chapter 6	Chapter 6 HW Recitation #8
9 10/28-11/3	21	Chapter 10.1-10.4	Chapter 10 HW Recitation #9
10 11/4 – 11/10	8,9,10,11,12	Chapter 7 and 11.1-11.3	Chapter 7/11 HW – part 1 Recitation #10
11 11/11-11/17	8,9,10,11,12	Chapter 7 and 11.1-11.3	Chapter 7/11 – part 2 Recitation #11
11/17		<b>EXAM 2: Chapters 5, 6, 10.1-10.4,</b>	
12 11/18 – 11/24	13	Chapter 8	Chapter 8 HW Recitation #12
11/25-11/25	13	Thanksgiving Week Chapter 8	
13 12/2-12/8	14	Chapter 9	Chapter 9 HW – part 1 Recitation #13
12/8		<b>EXAM 3: Chapter 7, 11.1-11.3, and 8</b>	
14 12/9-12/11	14	Chapter 9 and Review	Chapter 9 HW - part 2 Recitation #14 Basic: Chapters 1-8 Basic Chapters 9-12 ACS reviews: I and II

Updated by Dr. Christopher DeSantis– August 2025  
Department of Chemistry & Environmental Sciences (CES)  
Course Syllabus, Fall 2025

This syllabus is a tentative syllabus and may be subject  
to change.