

General Chemistry Lecture Syllabus, Sections BB–BD Summer 2022

All readings and assignments are in “*Chemistry: Structure and Properties*” (2nd Edition) by Nivaldo J. Tro, Exact pace of topics and associated problems subject to change, as determined in lecture. Sections covered in quizzes and exams subject to change if deemed necessary

	Date	Topic	Textbook	Suggested Problems
1	T May 31	Units of measurement, accuracy, precision, significant figures, SI units, unit conversion, density, energy, Problem solving	E1-E9	Chapter E: 21,23,25,27,33,35,37,39,41,43, 47, 49, 51, 61, 63, 71,85,95, Math sheet
2	W June 01	Classification of matter, law of conservation of mass, law of definite and multiple proportions, structure of the atom, isotopes, average atomic mass	1.1-1.9	Chapter 1: 35, 41, 45, 47, 53, 59, 61, 65, 69, 73, 75, 77, 91
3	Th June 02	Mole concept, nature of light, atomic spectroscopy, Bohr model of the atom	1.10, 2.1-2.4	Chapter 2: 37, 39, 41, 43, 69, 71, 73, 78, 85, 97 Review
4	F June 03	Photoelectric effect, Wave-particle duality, quantum numbers, orbitals	2.5-2.6	Chapter 2: : 51, 53, 57, 59, 61
5	M June 06	Electron configurations, structure of the periodic table	3.1-3.5	Chapter 3: 45,49,51, 53, 57, 59, 61, 69
6	T June 07	Periodic trends: ionization energy, atomic radius, electron affinity, metallic character	3.6-3.8	Chapter 3: 59, 61, 63, 65, 71, 73, 75, 83, 85, 87, 89, 91, 93
7	W June 08	Molecules and compounds, Ionic bonding, ionic compounds	4.1-4.6	Chapter 4: 29, 39, 41, 43, 45, 47
8	Th June 09	Covalent bonding , molecular compounds, formula and molar mass	4.7-4.9	Chapter 4: 49, 51, 53, 55, 57, 59, 63, 65, 67, 69, Review for Exam 1
9	F June 10	Percent composition, empirical formulas, combustion analysis, structure of hydrocarbons	4.10-4.12	Chapter 4 :83, 85,87, 95, 97, 99, 103, 105, 107, 109, 113, 121, 123
10	M June 13	Electronegativity, bond polarity, Lewis structures, formal charge	5.1-5.3	Chapter 5: 23,27,29,31,33,35,37,39,41,43
	T June 14	Exam I (1.40 pm-3.10 pm) (Chapters E, 1.1–4.10)		EXAM WILL BE JN-PERSON
11	W June 15	Resonance, exceptions to octet rule, bond energy/bond length	5.4-5.6	Chapter 5: 45,47,49,51,75,77,81,83,85,97
12	Th June 16	VSEPR, polarity of molecules, Hybridization, sigma and pi bonding,	5.7-5.10 61-6.3,	Chapter 5: 53,55,57,59,61,63,67,69,71,73 Chapter 6: 31,37,39,41,43,45 Review
	F June 17	Holiday		

13	M June 20	Balancing chemical equations Stoichiometry, limiting reactant, percent yield, combustion reactions	7.1-7.3 7.4-7.6	Chapter 7: 15,17,25,27,29,31,33,35,37,39,41,43,45,47,49,51, 59,61,63, 65,67,71
14	T June 21	Solutions, electrolytes, molarity, dilution problems, net ionic equations, precipitation reactions	8.1-8.5	Chapter 8: 21,23,27,29,31,33,35,37,39,45
15	W June 22	Acid-base reactions, redox reactions	8.5-8.9	Chapter 8: 47,51,53,55,57,59,61,65,67,69
16	Th June 23	Energy, First Law of Thermodynamics, calorimetry, enthalpy	9.1-9.6	Chapter 9: 33,35,37,41,43,45,47,49,51,53,55, 61,63,67,69 Review for Exam 2
17	F June 24	Calculating ΔH using Hess's Law, bond energies	9.7-9.10	Chapter 9: 71,73,75,77,79,81,83,85,89
18	M June 27	Born Haber Cycle,	9.11	Chapter 9: 91,93,95,96
	T June 28	Exam II (1.40 pm -3.10 pm) (Chapters 5.1–9.6)		EXAM WILL BE JN-PERSON
19	W June 29	Nature of gases, measurement of pressure, Gas laws, ideal gas equation	10.3-10.6	Chapter 10: 25,27,29,31 Chapter 10: 33,35,37,39,41,43,51,55,57,59,63,65, 69,
20	Th June 30	Kinetic molecular theory, relative diffusion rates, real gases	10.6-10.11	Chapter 10: 71,73,75,77,79,81,83,85,91,92 Review
21	F July 01	Liquids, nature of intermolecular forces,	11.1-11.7	Chapter 11: 33,35,37,39,45,47
	M July 04	Holiday		
22	T July 05	Vapor pressure, heating curves Phase diagrams.	11.8	Chapter 11: 41,51,53,55,57,63,65,67
24	W July 06	Catch up and review		
25	Th July 07	Final Exam 12:00–3:00 PM		EXAM WILL BE JN-PERSON (Cumulative : Ch E thru 11)

Important Quiz and Exam Dates

Date	Quiz	Material Covered	Date	Exam	Material Covered
June 3	Quiz 1	Sections Ch E, 1.1–1.8	June 14	Exam I	Sections Ch E, 1.1–4.9
June 10	Quiz 2	Sections 2.1-3.5	June 28	Exam II	Sections 5.1–9.6
June 24	Quiz 3	Sections 8.1–9.4	July 7	Final Exam	Chapters E thru 11
Jul 01	Quiz 4	Sections 9.6 – 10.10			

GENERAL CHEMISTRY (01:160:161) SUMMER 2022 SECTIONS BB–BD IN-PERSON INSTRUCTION

Welcome to General Chemistry I (160:161) for the summer of 2022. Chemistry 161 is the first semester of the general chemistry course. This handout provides information concerning course policies and procedures. You are responsible for all the information that follows. Feel free to ask questions to clarify any of the policies. Failure to comply with the rules contained in this packet can result in a loss of points and a consequent reduction in grade. No appeal will be considered on the grounds that you did not understand the rules.

Learning Goals:

1. Understand and apply basic principles and concepts in chemistry as applied to scientific topics, specifically:
 - i. Atoms and periodic table
 - ii. Quantum theory
 - iii. Chemical bonding
 - iv. Stoichiometry
 - v. Reactivity
 - vi. Gases
 - vii. Molecular Shapes
 - viii. Chemical Reactions and Energy Changes

2. Explain and be Able to Assess the Relationship Among Assumptions, Method, Evidence, Arguments, and Theory in the Analysis of Chemistry and Chemical Systems as demonstrated by the following:
 - i. Interpretation of Graphical and Tabular Data
 - ii Expression of Physical, Chemical or Scientific Processes in a Mathematical Form
 - iii. Solving Equations to Determine the Value of Physical, Chemical, and Scientific Variables
 - iv. Development of the Ability to Relate the Concepts Learned in the First Goal to Each Other in Ways that were Not Directly Explained in Class
 - v. Development of Critical Thinking Skills for the Application of The Knowledge to Scientific Processes
 - vi. Understanding of the Basics of the Scientific Method by Applying a Relevant Body of Knowledge to the Evaluation of Existing Scientific Studies and the Design of Studies to Test Specific Hypotheses

Assessment of Students

A combination of different tools will be used to assess the achievement of the above learning Chem 161 Summer 2022 General Information goals. These tools include the use of quizzes during both lecture and recitation meetings, multiple choice exam or open ended questions and other evaluation methods aimed specifically at each of these learning goals as they relate to the general chemistry course material presented.

Course Coordinator and Lecturer

Dr. Lipika Roychowdhury: lipikar@chem.rutgers.edu

Recitation Instructors

Lipika Roychowdhury : lipikar@chem.rutgers.edu

Guoyu(Gary) Zhang : gz102@scarletmail.rutgers.edu

Required materials

Text: “*Chemistry: Structure and Properties*” (2nd Edition) by Nivaldo Tro. You can purchase a physical copy of the textbook from various sites online, such as Amazon, eBay etc..It is also available at the Rutgers University Bookstore (732) 246-8448 and Livingston Bookstore (732) 445-3210 or at NJ Books (732) 253-7666..

The textbook is also available online as an e-book at <https://www.vitalsource.com/products/chemistry-nivaldo-j-tro-v9780134551326>

Scientific calculator (logarithms, exponential, powers, roots, etc.). This does not have to be anything more powerful than a \$15.00 calculator. The bookstore also sells scientific calculators. **Expensive, programmable calculators may not, under any circumstances, be used in this course.**

Classroom Management System

We will be using **Canvas** (<http://canvas.rutgers.edu/>) as a classroom management system. All communication with students will be done through the **Canvas** site. You should login to this website using your Rutgers NetID and password. Once on the site, click on Courses on the left . If you are registered for the class, you should see a Chem 161 BB BD Summer 2022 tab under courses. Clicking on that tab will enable you to get to the **homepage**, which will have all relevant information.

Course announcements will be posted on the **Canvas** site, using the “announcements” tab on the left .

The course policies, lecture schedule, lecture notes, review problems, practice exams will all be posted under Modules with specific headings on this canvas site.

You are responsible for all the information regarding course policies, procedures and announcements that are posted on canvas. It is your responsibility to check **canvas** every day.

In case of technical problems encountered during using the site, it is your responsibility to contact the Canvas Help Desk immediately, to resolve the issue. You can email tech support at help@canvas.rutgers.edu or call them at 877 361 1134

Lectures

There will be five lectures per week, each of 90 minutes length in **Beck Auditorium** from 1:40–3:10 PM. You should attend ALL lectures. Attendance is of utmost importance since the lectures will emphasize and

clarify important and difficult concepts. Attendance will not be taken during lecture given during lecture. You miss lecture at your own risk. Unless informed otherwise, you will be held responsible at exam time for having learned all the assigned readings whether or not they are explicitly discussed in class. Any changes in the course format and/or information about exams and quizzes will be announced in lecture and on **Canvas**.

Recitations

There will be two *in-person* recitations per week of 55 minutes length each. There are no online recitations in this course. The in-person recitations will be held **M, W, F**, either immediately before or after lecture depending on the section for which you signed-up. Be prepared, and do not hesitate, to ask questions to use recitation time effectively. Any material that is not clear in the textbook or the lectures should be discussed during recitations. Homework problems can be discussed in detail during recitation. Recitation is an integral part of the course and should be attended regularly.

Sec BB 12.30 - 1.25 pm BE 251

Sec BD 3.15 - 4.10 pm BE 251

There will be FOUR quizzes given during recitation. All four quizzes will count toward your cumulative grade. Each quiz is worth 25 points. Specific topics covered on each quiz are indicated in the syllabus. Quizzes will **not** be multiple choices and will be graded by your recitation instructor. Questions about how your quizzes are graded should be made promptly to your recitation instructor. Do not expect Quiz 1 to be re-graded the day before the final. If you do not make or request in a timely manner, you waive the right to make such complaints. Questions on quiz grades should be directed to your recitation instructor first and, as a last resort, the course coordinator/lecturer.

Recitation is an important part of this course. If you do not ask questions, you will remain confused. Do not merely attend recitation: participate. Do not let any resource at your disposal go to waste.

Recitation Quizzes

You are required to take your quizzes in your assigned recitation section. If you have to miss one quiz for any reason try to make up the quiz in the other time-slot. Notify your recitation instructor of your intent. Tell the recitation instructor where you are taking the make-up quiz to direct your quiz grade to your recitation instructor. Please note: merely informing your instructor does not guarantee that your request will be approved. You are expected to take your quizzes in your assigned section and you need a good, verifiable reason to take the quiz at another time. A missed quiz will be considered an excused absence only if proper documentation is provided, for example like a verifiable doctor's note. In that case the average of the remaining quizzes will be used to replace the missed quiz grade. If the excuse is not deemed legitimate, you will get a zero for the missed quiz.

Reading Material

The reading material listed in the syllabus is what will be covered in lecture. To get the most out of the lectures, you should read the appropriate sections the day before. The syllabus is an approximation. The actual pace of the class will have to be determined by the abilities of the class itself. Some days, we will be ahead of the syllabus; some days we may be behind.

Practice Problems

This is a very demanding course! To do well, you must keep up with the material by studying the text and lecture notes and by doing the suggested homework problems listed in the syllabus. When doing problems, use the study guide only as a last resort. If you had to use the study guide to solve a problem, go back to that problem in a couple of days and try to solve it on your own. Use the recitations to enhance your level of understanding.

There will also be problem solving worksheets posted on **Canvas** that you are highly encouraged to utilize. The answers for these problems can be discussed in recitation when requested.

Online practice questions will also be posted weekly on the website my.elearning.rutgers.edu. You will need to login to the site using your NetID and password.

These are meant for practice purposes only and will not be collected or graded.

See the eLearning Tech Support page for more information and step-by-step directions. <https://techsupport.elearning.rutgers.edu/> (Links to an external site.)

Reviews

There will be review sessions every week starting the first week of classes. . These will be on Thursdays immediately after lecture. We will concentrate on working exam problems relevant to the material we covered that week. There will also be some time for questions and answers about the week's material, quizzes, homework problems, etc. These sessions are optional and no new material will be presented.

Online HW

Graded homework will be provided and collected through eLearning, which will be required to be submitted by a specific date.

Examinations

Exams will be administered in-person during the lecture period in the lecture hall. There will be two 90-minute examinations. . The **Final Exam** is on July 7th, Thursday and is cumulative. Exams will consist of multiple choice / open ended questions. Sections covered in exams are subject to change as deemed necessary.

Date	Exam	Material covered
June 15	Exam I	Sections: Ch E, 1.1–4.10
June 29	Exam II	Sections : Ch 5.1–9.6,
July 7	Final Exam	Sections : Ch E, 1.1–12.6

Missed Exam

The summer is far too short for make-up exams. If you miss an exam on medical grounds, you **must** provide a written explanation and supporting documents (i.e., a note from your doctor specifically describing the medical emergency). You must be certified too sick to take the exam. Just “not feeling well” is not an excuse. If a student’s absence is deemed legitimate and excused, the weighted average of the other exam and the final exam will then count as the missed exam grade. If the excuse is not deemed legitimate, you will get a zero for the missed exam.

Any student who misses both exams will be asked to withdraw from the course. There is no way to assign a grade fairly based on the final and quizzes alone. A student who misses the Final Exam because of a legitimate and verified medical issue will be given a grade of “TF” and will have to arrange to take a make-up exam at a later date. If you have a documented disability that requires a special accommodation, such as extra time on examinations please contact the Office of Disabilities Services (<https://ods.rutgers.edu/>). They will certify your need and help us to determine specifically which adjustments should be made for your particular circumstance.

Everyone wants vacation time, and the summer session is when most families can have vacations. Unfortunately we will **NOT** grant early finals for any reason that we wouldn’t accept for any other exam (i.e. illness, religious holiday, etc). “Family trips,” and prepaid airline tickets are not excuses that will be accepted. If you have a trip which forces you to be away on July 7th, **DROP THE COURSE TODAY!**

Course Grading

An approximate grade distribution is provided. There is no “preset” number of points needed to obtain an “A,” “B,” or “C.” The conversion between point total and letter grade is not yet established and will be determined at the end of the courser.

Your final grade will be based on your overall percentage, with the final scale to be decided at the end of the course.

	Item	Points	% that counts towards the final grade
1	Exam 1	100	18
2	Exam 2	100	18
3	Final Exam	200	36
4	Recitation Quizzes	4 x 25 = 100	18
5	Online HW	5 x 20 = 100	10

IMPORTANT EXCEPTIONS to the letter grade assignment include conditions that result in an automatic failure (grade of “F”) regardless of Total Points. These conditions include:

- If you get lower than a 35% on the final exam. A grade of <35% on the final exam will result in **an automatic F for a final grade.**
- If you miss the Final Exam and do not have an approved excused absence.
- If you are caught cheating on any of the Quizzes, Midterm Exams or the Final Exam, or are in any other violation of the policy on Academic Integrity.

We will not disclose what the final point ranges are. We make every effort to include non-point related evaluations to adjust the grades to accurately reflect the level of learning you have demonstrated. Thus, two students with identical numbers of points may receive different grades, if that is warranted based on overall performance and improvement throughout the semester. We will not discuss the grades and performance of other students with you.

GRADES WILL BE SOLELY BASED ON YOUR TOTAL POINT SCORE IN THE COURSE AND NOT NECESSARILY ON YOUR KNOWLEDGE AND/OR THE AMOUNT OF TIME AND EFFORT YOU PUT IN.

Students with Disabilities

If you have a documented disability that requires a special accommodation, such as extra time on examinations please contact the Office of Disabilities Services (<https://ods.rutgers.edu/>). They will certify your need and help us to determine specifically which adjustments should be made for your particular circumstance. You must arrange for the course coordinator to receive a letter by the end of the first week from the Office of Disability Services.

The following is copied from the Summer Sessions website.

- Rutgers University students should contact The Office of Disability Services at (848) 445- 6800 or dsoffice@rci.rutgers.edu. The Office of Disability Services is located at Suite A145 in Lucy Stone Hall on the Livingston Campus.

Information is also available at <http://disabilityservices.rutgers.edu>.

- Non-Rutgers students enrolled in New Brunswick courses should contact The Office of Disability Services at (848) 445-6800 or dsoffice@rci.rutgers.edu. Accommodations are made on a case by case basis and students are required to submit documentation confirming their disabilities 30 business days prior to the start date of class.

Additional Help

If, despite attending all lectures and recitation classes and working out all practice problems, you realize that some difficulties remain with understanding the course material, then seek help early! A list of office hours for the lecturer and the recitation instructors will be posted on **Canvas**. We will be glad to assist you as long as you take the initiative.

Help is available if you go looking for it.

Chain of Command

In general, routine questions regarding course material, practice problems, quizzes, exam scores, absences, etc. should be directed first to your recitation instructor. Only for further information, or if the above procedure fails to resolve a particular problem, should you contact Dr. Roychowdhury, the course coordinator/lecturer. Questions regarding lecture material can be directed either to your recitation instructor (this is a very good use of recitation time) or directly to the lecturer, as time permits. Specific comments or requests are always valued.

Intellectual Property

The material for this course is copyrighted and may **NOT** be posted on any other web site at or outside of Rutgers without permission. Any lecture notes or supplementary material posted on **canvas** is for your own use only. Any violation of this policy will be treated as an academic integrity violation and will be referred to the Office of Student Conduct or Equivalent for action.

Academic Integrity

- Students are expected to maintain the highest level of academic integrity. You should be familiar with the university policy on academic integrity: <http://academicintegrity.rutgers.edu/academic-integrity-policy/>. Violations will be reported and enforced according to this policy.
- Use of external website resources such as Chegg.com, courseblue or others to obtain solutions to homework assignments, quizzes or exams is cheating and a violation of the University Academic Integrity policy.
- Cheating in the course may result in penalties ranging from a zero on an assignment to an F for the course, or expulsion from the University.
- Posting of homework assignments, exams, recorded lectures, or other lecture materials to external sites without the expressed written permission from the instructor is a violation of copyright and constitutes a facilitation of dishonesty, which may result in the same penalties as explicit cheating.

We hope you have a successful experience !