

Chemistry 163A, 2022 Summer
Quantum Mechanics and Basic Spectroscopy

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Prerequisites/corequisites

Prerequisite(s): CHEM 1B and CHEM 1C; PHYS 5A, PHYS 5B, and PHYS 5C or PHYS 6A, PHYS 6B, and PHYS 6C; and MATH 22 or MATH 23B. PHYS 6C can be taken concurrently.

Lecture Time and Location: MW 1:00 – 4:30 pm, Zoom

My course is hosted on [Canvas](#). You do not need to sign up for an account, login with your CruzID and Gold Password at canvas.ucsc.edu. See [Canvas Getting Started Student Guide](#)."

Instructor Office Hours: Tuesdays 1:00 – 3:00 pm, Zoom

TA Office Hours: Tuesdays and Thursdays 6:00 – 7:00 pm, Zoom

Introduction:

Chemistry 163A provides a detailed introduction to quantum theory and the application of wave mechanics to problems of atomic structure, bonding in molecules, and fundamentals of spectroscopy. The concepts taught in this course are instrumental for future studies in all areas of chemistry. The knowledge derived from this course will give students insight into the chemical workings of our lives and the world around us.

Required Text: *Quantum Chemistry*, 2nd Edition by Donald A. McQuarrie (ISBN 978-1-891389-50-4)

<http://ucsc.textbookx.com/institutional/index.php?action=browse#books/3366323/>

Chapter	Section	Chapter	Section
1	1.1-1.14	7	7.1-7.9
2	2.1-2.4	8	8.1-8.3
3	3.1-3.9	9	9.1-9.5, 9.9-9.13
4	4.1-4.8	10	10.1-10.4
5	5.1-5.10, 5.12	11	11.1-11.7
6	6.1-6.8		

Course credit:

Midterm: 20%; Final: 40%; Problem Sets: 20%; Quizzes: 20%. Passing score is 50 (out of 100).

Lecture, Homework, Quizzes and Exams

1. Lectures will be delivered via Zoom synchronously and recorded. The recorded lectures will be posted on Canvas/Google drive. Since this course will be delivered via remote instruction, you would need computer and internet access. Please contact the instructor immediately if you have accessibility issues.
2. Weekly quizzes will be taken in class via Canvas. Each quiz will have 4-5 questions (15-20 min). If you missed a quiz, you would get zero mark for that quiz. In case of emergency, please get approval from the instructor.
3. There are 4 homework assignments in total. They are due in Monday class. We will not accept late homework assignment (zero mark for that assignment).
4. Mid-term exam will have 4 questions. The exam time is 90 min.
5. Final exam is accumulative. There are 8 questions in total. The exam time is 180 min.
6. Graphical calculators are not allowed to be used in exams/quizzes.

Communication:

1. I am happy to take your questions via email and can usually get back to you within a day.
2. I will NOT answer any quiz- and exam- related questions outside the classroom.
3. Homework sets, grades, supplementary materials, and important announcements will be posted on Canvas.
4. Homework assignments should be submitted to Canvas in pdf format.

Class Schedule:

Date	Monday	Wednesday	Friday
June	20 (Juneteenth)	22 (chapters 1 & 2)	24 (chapters 3 & 4) + Quiz 1
June/July	27 (chapters 4 & 5) + HW 1	29 (chapter 6) + Quiz 2	
July	4 (Independence Day) + HW 2	6 (Mid-term, chapter 7)	
July	11 (chapters 8 & 9) + HW 3 + Quiz 3	13 (chapters 9 & 10)	
July	18 (chapter 11) + HW 4 + Quiz 4	20 (Final exam)	

Midterm: Wednesday, July 6, 1:00-2:30 pm

Final Exam: Wednesday, July 20, 1:00 – 4:00 pm

Exam Policy:

1. You must be present at each of the exams. A missed exam will be treated as a zero in your class record.
2. If you have emergency and cannot take an exam, you must: i) contact the instructor as early/soon as you can and ii) provide supporting documentation. Arrangements for a make-up exam or alternative will be dealt with on a case-by-case basis.
3. A couple of minutes before the exam, I will upload the exam paper to Canvas. You can download and print it before the official start time. You need to take the exam with your camera ON (showing you and the surrounding). After the exam, you will have 15 min to upload your work (in pdf format), and you must get this done before leaving the Zoom meeting.

Student hours

Systemwide Senate Regulation 760 specifies that one academic credit corresponds to a total of 30 hours of work for the median student over a quarter (e.g., 3 hours per week for a 10-week quarter). CHEM 163A is a 5-unit summer course, it is expected that you would spend ~30 hours per week on this course. Specifically:

1. Lectures (7 h)
2. Instructor office hours (2 h)
3. TA office hours (2 h)
4. Doing homework assignments and practice questions (9 h)
5. Reading the textbook and lecture notes, preparing for quizzes and exams (10 h)

Academic Integrity

Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree.

All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC.

In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript.

For the full policy and disciplinary procedures on academic dishonesty, please refer to the [Academic Integrity page](#) at the Division of Undergraduate Education.

DRC Student Accommodation

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me through email, preferably within the first weeks of the summer session. We would also like us to discuss ways we can ensure your full participation in the course. We encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.