

Chemistry 255: Modern Physical Chemistry

- Instructor:** Sarah Petty
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Office Hours: Tuesdays 1 – 2 pm; Wednesdays 2 – 4 pm; Thursdays 5 – 7pm.
Wherever possible, please keep to these times. If you have conflicts with all of these hours, appointments can be scheduled by email. Please note the changes from last semester.
- Classes:** Haberlin 19. Mondays, Wednesdays and Fridays: 10:00 am.
To avoid disruptions, please arrive on time and remain in class for the duration. Everyone will be required to actively participate in class, by asking and answering questions; to maximize the benefits of class discussion you should have read through your notes from the previous lecture and any relevant material in the text book, prior to coming to class.
- Reading:** The following text is required for this course:
Quantum Chemistry and Spectroscopy, Thomas Engel; Benjamin Cummings. (ISBN: 0-8053-3843-8). You may also find the solution manual a useful addition when studying for exams (ISBN: 0-8053-3849-7).
Chapters 14 and 15 from *Thermodynamics, statistical thermodynamics and kinetics* will also be required. If you do not have this book, please see me, before considering buying it.
- Problem sets:** You will be given 7 problem sets over the course of the semester which will be handed out in class and posted on Blackboard. The due date will be shown on the problem set and will typically be 1 week after it is available. Late problem sets will not be graded for credit. **No exceptions.**
- There will be 40 points available for each problem set. Students routinely scoring less than 25 on problem sets should schedule time with me to discuss their progress (outside office hours if necessary).
- While you are encouraged to discuss with others how to solve the problems, the final work you turn in must be your own. **Please list the names of anyone you work with on the problem sets.**
- Tests:** Three in-class tests will be scheduled over the course of the semester on February 16th, March 28th and April 27th. No notes will be allowed and you must work alone. Equation sheets will be provided.
Tests can only be rescheduled with a Dean's note.
- Each test will be marked out of 80 points.
- Final Exam:** This exam will be cumulative, testing everything we have covered in the semester. It will be held on May 11th at 8:30 am (subject to change by the Dean) and will last for 3 hours. No notes will be allowed and you must work alone. Equation sheets will be provided.

Grading: The total number of points available for the semester is 640. The break-down is as follows:

Problem sets (6 to count from 7):	240 pts.
Tests (3 to count from 3):	240 pts.
Final exam:	160 pts.

Academic Honesty: At all times the work you turn in must be your own. Discussion is encouraged when working through problem sets, but your final answers must be your own. No discussion is permitted during in-class tests or the final exam. Any violations of the college academic honesty policy including, but not limited to, copying problem sets, cheating on exams and plagiarism, will be treated very seriously; punishments will be determined on an individual basis but may involve the individual receiving an F for the course. Any confirmed instances of academic dishonesty will be reported to the Class Dean. You are referred to the course catalogue for further information regarding this important issue.

Course Overview: This course aims to develop an understanding of statistical mechanics, the mathematical foundation of quantum mechanics and the chemical relevance of quantum mechanics. If time permits, we will spend the final classes discussing computational chemistry.

Topic	Text Book Chapter
Statistical Mechanics	14, 15 (last semester's book)
Differential equations	-
Classical to Quantum	1
Waves and the Schroedinger Equation	2
QM postulates	3
Fundamental QM models	4, 5, 7 – 9
Atoms	10, 11
Molecules	12 – 15 (17)
(Computational Chemistry	16)