

Course Syllabus

CEM 181H Honors Chemistry I

Note syllabus may be adjusted from time-to-time.
This version is from August 21, 2016

Credit: 4 hours (3 hours lecture and 1-hour recitation per week)

Prerequisites: (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently); Requires Approval of the Department

Textbook: Oxtoby, Gillis, Butler "*Principles of Modern Chemistry*," Cengage Learning 8th edition

There will be two midterms and one final exam.

Quizzes will take place during the first 20 minutes of the Thursday lectures.

Note, we shall not cover Unit I (self-study), and we will cover Chapter 3 after Chapter 5.

Topic	Chapter	Dates
0. Introduction to 181H and review of main concepts in Unit I		9-1
1. Introduction to Quantum Mechanics	4.1 to 4.4	9-6 to 9-8
2. The Schrödinger Equation and model systems	4.5 to 4.7	9-13 to 9-15
3. Quantum structure of atoms	5.1 to 5.2	9-20 to 9-22
4. Quantum basis for the periodic table	5.3 to 5.5	9-27 to 9-29
• First Exam	10-4	
5. The periodic table and periodic trends	3.1 to 3.5	10-6
6. Formation of chemical bonds - introduction	3.6 to 3.9	10-11 to 10-13
7. Representing molecules (Lewis) and molecular shapes (VSEPR)	3.10 to 3.13	10-18 to 10-20
8. Quantum Mechanics of the chemical bond	6.1 to 6.3	10-25* to 10-27
9. Chemical bonding in diatomic molecules	6.4 to 6.7	11-1 to 11-3
10. Bonding according to Valence Bond Theory and LCAO Method	6.8 to 6.13	11-8* to 11-10
• Second Exam	11-15	
11. Bonding in organic molecules	7.1 to 7.4	11-17
12. More about organic molecules and their reactions	7.5 to 7.6	11-22
13. Chemistry of the transition metals and coordination chemistry	8.1 to 8.3	11-29 to 12-1
14. Crystal field theory and coordination complexes	8.4 to 8.6	12-6 to 12-8
• Final Exam	TBD	