

FLORIDA INTERNATIONAL UNIVERSITY
CHM 6480 QUANTUM MECHANICS
FALL 2020

Instructor: Jeff Joens
Office: CP 331; phone 348-3121 (voice mail)
Web page: www.joenschem.com

Time: T, R 12:30pm to 1:45pm
Room: Green Library 132
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Office hours: Tuesday and Thursday 4:00pm to 5:00pm
Monday and Wednesday 2:00pm to 3:00pm

Course objective: To provide in one semester coverage of advanced topics in quantum chemistry.

Prerequisites: Math, up to MAC 2312 (Calculus 2); one semester of undergraduate quantum mechanics at the level of CHM 3411.

Text: Ira N. Levine, Quantum Chemistry, Seventh Edition (Pearson, 2016), plus handouts.

Grading:	Homework	100 points
	Exams (2 x 100)	200 points
	Final exam	<u>150 points</u>
	TOTAL	450 points

- Notes:
- 1) Final grades will be based on total accumulated points.
 - 2) The final exam will be comprehensive. You must take the final exam to pass the course.
 - 3) The hour exams and final exam will be open book, handout, and notes.
 - 4) Homework assignments will be given approximately once a week, and will be collected and graded. Late homework will not be accepted. In calculating your homework grade, your lowest two scores on the homework assignments will be dropped. Homework solutions and exam solutions will be posted on my website.
 - 5) Cheating or assisting other students in cheating is a violation of University policy and will be punished.

Disability Resource Center provides assistance for students with a disability. I will make accommodations for students with a disability as needed under the advisement of the Disability Resource Center located in GC-190. (305-348-3532). Their website is: <http://studentaffairs.fiu.edu/student-success/disability-resource-center/>

Academic misconduct: *Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook. **Cheating is unfair to your honest classmates and absolutely will not be tolerated.** The first such infraction will be dealt with to the fullest extent permissible by the University. Cheating includes (but is not limited to) any form of inter-student collaboration on exams, use of prohibited materials or devices during exams, copying or distribution of quiz or exam answers prior to or during the exams, and plagiarism. For more information go to: https://ugrad.fiu.edu/academic_misconduct/Pages/Home.aspx*

Tentative course outline

Note: The outline given below should be considered tentative. It may be revised depending on how the class progresses throughout the semester.

Chapter 1 - The Schrodinger Equation

Chapter 2 - The Particle In a Box

Chapter 3 - Operators

Chapter 4 - The Harmonic Oscillator

Chapter 5 - Angular Momentum

Chapter 6 - The Hydrogen Atom

Chapter 7 - Theorems of Quantum Mechanics

FIRST EXAM – Thursday, October 8th

Chapter 8 - The Variational Method

Chapter 9 - Perturbation Theory

Chapter 10 - Electron Spin and the Spin-Statistics Theorem

Chapter 11 - Many Electron Atoms

Chapter 12 - Molecular Symmetry

Chapter 13 - Electronic Structure of Diatomic Molecules

SECOND EXAM – Thursday, November 12th

Chapter 14 - Theorems of Molecular Quantum Mechanics

Chapter 15 - Molecular Electronic Structure

Chapter 16 - Electron-Correlation Methods

Chapter 17 - Semiempirical and Molecular-Mechanics Treatments of Molecules

FINAL EXAM - TBA