Chemistry 163A
Quantum Mechanics & Basic Spectroscopy

Department of Chemistry and Biochemistry
University of California, Santa Cruz

Yuan Ping
Instructor

Yuan Ping
Office: Physical Science Building (PSB) 354
Email: yuanping@ucsc.edu
Office hours:
Monday 5:00pm-6:00pm (PSB 354)
Wednesday 1:30pm-2:30pm (PSB 354)
Teaching Assistants

Pamela Schleissner
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Email: pschleis@ucsc.edu
Office hours: Tues 4-5pm

Chunhao Guo
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Email: cguo17@ucsc.edu
Office hours: Mon 3-4pm
MSI Support

Dana Byrne
Email: dobyrne@ucsc.edu
Office hours: TBD
Office: TBD
Textbook

Supplementary Book

Quantum Chemistry
7nd Edition by Ira N. Levine
Course Grade

Midterm: 30% (1hr)
Final: 40% (3hr)
Before class quiz: 10%
Problem Sets: 20% (selectively graded)
Total: 100%

Passing score: 50 (out of 100) or 1 standard deviation below the class average
Quizzes & Exams

Each before-class quiz will have one to two questions (5-10 min)

Mid term will have 5 questions for 1 hr

Final exam is accumulative, 10 questions for 3 hr
General Policies

1. Academic Misconduct Policy for Undergraduates
   https://www.ue.ucsc.edu/academic_misconduct

2. Attending discussion sections are not mandatory but highly recommended.

3. No late homework assignment (zero mark for that assignment).

4. Graphical calculators are not allowed to be used in exams/quizzes

5. Show up in class and sections on time and be prepared

6. No electronic devices (e.g. cell phone, laptops and game boys) during lecture (exceptions require instructor permission), violation can result in confiscation of the device
General Policies

7. No talking during lecture in any way causing unnecessary disruptions
8. Staying in your seat during the lecture unless it is absolutely necessary to leave
9. Exam policies: A missed exam is treated as a zero in class record. If any emergency situation, you must: i) contact the instructor before the exam takes place ii) provide documentation from your physician or police. Other cases are NOT considered as emergency and NO exceptions/make-up exams will be granted. No makeup for mid-term and weekly quizzes in any condition (if any emergency situation explained above, the corresponding percentage will be transferred to the final exam).
Communication

Instructor and TAs are happy to take your questions via email and can usually get back to you within a day.

Instructor and TAs will NOT answer any quiz- and exam- related questions outside the classroom.

Homework sets, answers, grades, supplementary materials and important announcements will be posted on UCSC Canvas.

Graded homework assignments and quiz will be returned in discussion sections.
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 privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, 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.
# Class Schedule

<table>
<thead>
<tr>
<th>Month/dates</th>
<th>Monday</th>
<th>Wed.</th>
<th>Friday</th>
<th>Chapter</th>
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<tbody>
<tr>
<td>Sept</td>
<td></td>
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<td>27 (First-lecture)</td>
<td>1</td>
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<tr>
<td>Sept-Oct</td>
<td>30</td>
<td>2</td>
<td>4</td>
<td>1,2</td>
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<tr>
<td>Oct</td>
<td>7</td>
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<td>Oct</td>
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<td>Oct</td>
<td>21</td>
<td>23</td>
<td>25</td>
<td>5</td>
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<tr>
<td>Oct/Nov</td>
<td>28* (Midterm)</td>
<td>30</td>
<td>1</td>
<td>6</td>
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<tr>
<td>Nov</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>6-7</td>
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<tr>
<td>Nov</td>
<td>11 (Veterans Day)</td>
<td>13</td>
<td>15</td>
<td>7-8</td>
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<tr>
<td>Nov</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>8</td>
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<tr>
<td>Nov</td>
<td>25</td>
<td>27</td>
<td>29 (Black Friday)</td>
<td>9</td>
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<tr>
<td>Dec</td>
<td>2</td>
<td>4</td>
<td>6 (last-lecture)</td>
<td>10+ Review</td>
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<tr>
<td>Dec</td>
<td>9</td>
<td>11</td>
<td>13**(Final)</td>
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*Midterm: Monday, October 28  
TA Review session: Oct 26 or 27, location: TBD

**Final Exam: Friday, December 13, 8am – 11am  
TA Review session: Dec 7, 2019; location TBD
Class Contents

QM history, math review and wave mechanics (Chap. 1, 2)
Simplest Example of QM – Particle In a Box (Chap. 3)
Postulates and General Principles of QM (Chap. 4)
Harmonic Oscillator and Vibrational Spectroscopy (Chap. 5)
Rigid Rotator and Rotational Spectroscopy (Chap. 6)
Hydrogen Atom (Chap. 7)
Approximate Methods for QM (Chap. 8)
Many Electron Atoms - Pauli principles and Hartree Fock Approximation (Chap. 9)
Chemical Bond – Born-Oppenheimer Approximation and Molecular Orbital (Chap. 10)
## Discussion Section Schedule (TBD)

<table>
<thead>
<tr>
<th>Section</th>
<th>Days &amp; Times</th>
<th>Room</th>
<th>TA</th>
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<tbody>
<tr>
<td>1A</td>
<td>M 8:00 - 9:05 AM</td>
<td>Kresge 325</td>
<td>Chunhao Guo</td>
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<tr>
<td>1B</td>
<td>M 1:20 - 2:25 PM</td>
<td>Kresge 325</td>
<td>Chunhao Guo</td>
</tr>
<tr>
<td>1C</td>
<td>Tu 5:20 - 6:25 PM</td>
<td>Kresge 325</td>
<td>Pamela Schleissner</td>
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<tr>
<td>1D</td>
<td>Tu 6:40 - 7:45 PM</td>
<td>Kresge 325</td>
<td>Chunhao Guo</td>
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<tr>
<td>1E</td>
<td>F 1:20 - 2:25 PM</td>
<td>Oakes 222</td>
<td>Pamela Schleissner</td>
</tr>
<tr>
<td>1F</td>
<td>F 8:00 - 9:05 AM</td>
<td>Kresge 325</td>
<td>Pamela Schleissner</td>
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CHEM 163A: Introduction
Important resources for this class

Study-guide for 163A class (canvas under files folder)
Math-review summary (canvas under files folder)
Practice exams for midterm and final (canvas under files folder)
Math review sessions outside class (twice this quarter)
MSI and office hours
Keys to Success in This Class

U can do it! Be confident.

Come prepared

Start earlier

Cooperation
Questions?