No (specifically) Required Textbook: Useful texts include *the one you have* or something like: “Physical Chemistry”, P. W. Atkins, or similar titles by Levine, Raff, Castellan, etc.

{See Brucat if you have questions...}

Instructor: PJ Brucat
Office Location: CLB311E
Office Hours: by appointment
Office Hours Location: CLB313 (PChem Conf Rm)
Contact info
Email: Use iTeach Messaging
Phone: 392-4654 (use iTeach messaging first)

Teaching Assistant: Shuai Wang and Jonathan van der Henst Solis
TA Office Location: TBA
TA's Office Hours: TBA

Course Website: [http://iteach2.chem.ufl.edu/24/](http://iteach2.chem.ufl.edu/24/)

Tentative Syllabus (for exact ordering and schedule of lectures, see the course website)

An Introduction to Quantum Mechanics
- Compare and Contrast Classical and Quantum Descriptions of Matter
- Fundamental Principles (Postulates) of Quantum Mechanics
- Operators, Observables, Wavefunctions, Eigenvalues, and Boundary Conditions

Exactly Soluble Systems in One Dimension
- Free Particle: Particle in a Box
  - The Harmonic Oscillator
  - Traditional (Diff. eq.) Treatment
  - Operator Algebra Treatment

Systems in More than One Dimension
- 3D Particle in a Box
- 3D SHO
- Rigid Rotation and the Spherical Harmonics
- The Hydrogen Atom
- Many-Electron Atoms

Approximate Methods in Quantum Mechanics
- Perturbation Theory
- Variational Principle

Independent Particle Approaches to Electrons in Molecules
- Molecular Orbitals (Qualitative Aspects)
- Molecular Symmetry and its Consequences

Understanding Molecular Motion Spectroscopically
- The Separation of Molecular Motion by Time/Energy Scale
- The Measurement, Excitation and Control of Molecular Motion with Light
- A Survey of Spectroscopic Techniques
- Magnetic Resonance, Coherence, and Pure vs. Mixed States
This course is different from most other courses

That is not as bold a statement as it may seem. First, the subject matter (Quantum Mechanics and its applications) is so odd that we will ask and answer questions about the world around us in ways that you might never have imagined. So, the course is different because the subject is different.

Any enthusiastic student of Quantum Mechanics knows that learning this subject requires a different mind-set when compared to other topics of similar complexity. Thus, the organization of this class is also different to help foster this mind-set. 'Lectures', which will now be called 'readings', will be absorbed outside of class (at 'home'), and traditional 'homework' activities will be performed during our class meetings. The eduspeak [sic] people call this a 'flipped' class, and it is quite en vogue these days.

Naturally, the 'readings' are not going to be complete enough to satisfy every given individual on every topic/concept in covered in this course. Therefore, it is up to the student to seek additional information from your textbook, the library, etc. as you need it. See one of your instructors for assistance if you have difficulty finding material on a particular topic.

Oh, and you're going to need a computer

The course website: http://iteach2.chem.ufl.edu/24 is where the 'lecture' ⇒ 'reading' materials are found. Naturally, all course operation details and communication tools are there, too. The format of these materials is somewhat varied, and some work better than others. Some delivery formats may have bugs and not work on all devices equally well. For example, some smartphones or tablets might not work correctly when viewing the modules. You are going to have to be a little more flexible, understanding, and tech savvy with in this environment than in a typical lecture-based class, but it will be worth it. Next time I teach this course I will tell your successors stories of your valor and bravery. The Science Library computers have all the tech requirements for this course, in case you don't, and there are knowledgeable and helpful people around them as well.

Attendance

This term, we are going to learn Quantum Mechanics and Spectroscopy as a team. Therefore, your timely presence in our class meetings is kindly requested. You are an integral part of the classwork sessions, so class meetings are very important. If you choose not to attend, that is your choice, but this action lets down your classmates, and forfeits your rights to classwork points (see below) and Instructor office hours, scheduled or by appointment. If you cannot attend class due to a medical/justifiable reason, contact your Instructor.in advance using the website messaging tool.

Office Hours

Office hours held by Brucat are intended for one-on-one discussion of a students standing in the class (grades), learning strategy and habits, and any other things not appropriate for the group discussion They will be held at times you arrange. If you want a meeting of this sort, message your instructor 3 options for meeting times that are convenient for you, and your instructor will message make the choice that works.

Office hours held by TA's are to provide perspective different from Brucat and his 'Readings' on the subject material. TA office hours will be posted on the course website calendar or by appointment.

--- Graded Activities ---

On-line Quizzes and 'Readings'

Periodically throughout the term, short on-line assessments will be delivered through the course website. These 'Quizzes' will appear in the website topics list and on the course calendar. Instructions for each quiz will be explicitly stated for each one at its start; Please read these instructions carefully.

Brucat's 'Readings' are also delivered on-line, and have a few embedded assessment questions which are graded.

As the course is presently crafted, there are 10 on-line 'Quizzes' and 30 'Readings' which have total 160 grade points.

'Homework' is now 'Classwork'

We do what would normally be called 'Homework' in class; 'flipped' remember? Problems relevant to the material and concepts covered in our 'readings' will be worked in class, by you, the TA and the Instructor together as a team. No more frustrating nights not knowing where to start. 'Classwork' will be valued at 20 grade points per week for a total of 240 grade points.
Exams

There will be **four** in-class exams during the term, which determine the bulk of your course grade, *tentatively* to be held on the following Thursdays:

May 31      June 21      July 19      August 07

I write the Songs... but you write the Exams. That's right! For each of the 4 parts of the course, there will be a Wiki for you the class to construct the actual exam you will take. Not as easy as you think, really. Exam grades will be based partially on your individual work on Exam day and partially on the grade your instructor gives the Wiki. So, do a good job writing the Exam.

Course Grade Computation

Course grades will be computed from the sum of earned points by the student. Each exam has a maximum value of 150 grade points for a category total of 600 points. Your 'Readings' + 'Quiz' (160 points) and 'Classwork' (240) bring the grade point total for the term to 1000. Your letter grade will be computed from this 1000 grade point total using this scheme:

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Minimum Total Score</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>A-</td>
<td>800</td>
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<tr>
<td>B+</td>
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<td>E</td>
<td>&lt; 500</td>
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We, the members of the University of Florida Community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.