

CHM6470: Chemical Bonding and Spectra I

Instructor: Clifford Bowers

Email: Please use Canvas messaging for all correspondence

Office Hours: T 10:30-12:00

ID: 954 947 5969

Pass: CHM4411

[Zoom Link \(Links to an external site.\)](#)

Meeting Times: MW Period 5-6 (11:45 AM – 1:40 PM)

Textbook (Required)

Quantum Chemistry, by Ira N. Levine, 7th Edition, ISBN: 9780321918185

Software (Required)

Mathematica, student edition. Wolfram's symbolic math program. Students have access to Mathematica through UFApps. A tutorial can be found here:

<https://www.wolfram.com/language/elementary-introduction/2nd-ed/index.html>

Matlab, available for download with Departmental site license.

<https://uflorida.sharepoint.com/sites/clas/chem/Software>

Course Description

Quantum mechanics formulation for model systems, atoms and molecules, and various types of molecular spectroscopy of these systems.

Activity Schedule (subject to change)

Week	Date	Topic	Reading	Homework
1	Aug 23	Introduction	Ch1 Levine	
2	Aug 30	Schrodinger equation	Ch2 Levine	Problem Set #1.
3	Sept 6	No class meeting, Labor Day		
	Sept 8	Operators/Particle in a Box	Ch3 Levine	
4	Sept 13	Harmonic oscillator	Ch4 Levine	

5	Sept 20	Angular momentum	Ch5 Levine	
6	Sept 27	Angular momentum (cont'd)		
7	Oct 4	Rigid rotor, particle on a sphere		
		Midterm 1		
8	Oct 11	Hydrogen atom	Ch6 Levine	
9	Oct 18	Dirac Notation, Matrix Representation		
10	Oct 25	Theorems of Q.M.	Ch6 Levine	
11	Nov 1	Variational Methods	Ch8 Levine	
12	Nov 8	Perturbation theory	Ch9 Levine	
		Midterm 2		
13	Nov 15	Electron spin and Pauli principle	Ch10 Levine	
14	Nov 22	Thanksgiving, no class meeting		
15	Nov 29	Hartree Fock, many electron atoms	Ch11 Levine	
16	Dec 6	Density operator and LVN equation	Notes	
	Dec 16	FINAL EXAM @ 12:30 – 2:30 PM		

UF COVID-19 Statements

1) Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

2) Lectures and office hours will be conducted through Zoom. The course is managed through Canvas. Course materials will be provided to you with an excused absence, and you will be given a reasonable

amount of time to make up work.

[More information in the university attendance policies](#)

Attendance Policy

If you're going to miss any lecture for any reason, please let the instructor know in advance. Don't be late. I keep tabs on that.

Homework

Homework will be assigned but not graded. Homework solutions will be provided.

Grading

Your grade will be derived from the weighted average of performances in each component:

Quizzes	500 points
Exams	500 points
Total	1000 points

A grade deduction may be applied for excessive copying or sharing of the problem set answers between or among users on external social media type apps. This borders on honor code violations which will be reported. No copying, sharing, or cooperation of any kind is allowed on quizzes or the exam. You must work independently on those assignments.

Grade Scale:

Grade	Range
A	1000-800
B	800-700
C	600-700
D	500-600

Anyone scoring over 900 points will receive an A grade, 800-900 will be B, and 700-800 will be a C. However, it is anticipated that the class may eventually be "curved" downward.

All grades will be posted in Canvas, as available.

UF's Grading Policy

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Software

PDF Scan Software - for scanning your homework pages into PDF for uploading onto Canvas. [Genius Scan](#), by Grizzly Labs, is highly recommended. The app is available for IOS or Android phones. PDF scans can be directly uploaded to Cloud Storage such as UF Google Drive, Dropbox, or UF OneDrive.

Word Processing - The standard is MS Word with the built-in equation editor. Any other word-processing software with equation editing capability is also acceptable. Fancier equation formatting can be achieved using the [MathType](#) plugin from Design Science is optional.

UFApps - UFApps offers a large number of different software packages to UF students free of charge.

UF OneDrive - required for transferring files between your local computer and UFApps.

Required:

Mathematica, student edition. Wolfram's symbolic math program. Students have access to Mathematica through UFApps. A tutorial can be found here:

<https://www.wolfram.com/language/elementary-introduction/2nd-ed/index.html>

Matlab, available for download with Departmental site license.

<https://uflorida.sharepoint.com/sites/clas/chem/Software>

Late Submission Policy

Late assignments will receive a late penalty of 10% per day past the scheduled due date. If something arises that prevents you from completing the assignment on time, contact the instructor as soon as possible to request an extension.

Getting Help

For the quickest response, you might find it useful to post questions to the Canvas Discussion Board. Messaging the Instructor or even a classmate also works.

For Username/Password issues, such as difficulties logging into any Gatorlink-authenticated site at UF, (including our course website), please contact the UF Help Desk at: helpdesk@ufl.edu, (352) 392-HELP - select option 2.

UF Policies Shaping This Course

This course is aligned with the UF policies below.

- Contact Hours: "Contact Hours" refers to the hours per week in which students are in contact with the instructor, excluding office hours or other voluntary contact. The number of contact hours in this course equals the number of credits the course offers.

- **Workload:** As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work outside of class for every contact hour. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.
- **Accommodation for Student with Disabilities:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. This class supports the needs of different learners; it is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.
- **Statement Regarding Evaluations:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available from [the Gatorevals website](#). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [the evaluation system](#). Summaries of course evaluation results are available to students at the [public results website](#).
- **Statement Regarding Course Recording:** Our class sessions may be audio visually recorded for students in the class to refer back to and for use of enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded. If you are unwilling to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

University Policy on Academic Misconduct

This class will operate under the policies of the student honor code which can be found at: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>. The students, instructor, and TAs are honor-bound to comply with the Honors Pledge: **We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.** You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks. Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>.

Additional UF Policies and Resources

University Police

The UF police are together for a safe campus. 392-1111 (or 9-1-1 for emergencies)
<http://www.police.ufl.edu/>.

Career Connections Center

[Career Connections Center](#)(352-392-1601 | CareerCenterMarketing@ufsa.ufl.edu) connects job seekers with employers and offers guidance to enrich your collegiate experience and prepare you for life after graduation.

Counseling and Wellness Center

[Counseling and Wellness Center](#)(352-392-1575) provides counseling and support as well as crisis and wellness services including a [variety of workshops](#) throughout the semester (e.g., Yappy Hour, Relaxation and Resilience).

Dean of Students Office

[Dean of Students Office](#)(352-392-1261) provides a variety of services to students and families, including [Field and Fork](#) (UF's food pantry) and [New Student and Family programs](#)

Disability Resource Center

- [Disability Resource Center](#)(DRCaccessUF@ufsa.ufl.edu | 352-392-8565) helps to provide an accessible learning environment for all by providing support services and facilitating accommodations, which may vary from course to course. Once registered with DRC, students will receive an accommodation letter that must be presented to the instructor when requesting accommodations. Students should follow this procedure as early as possible in the semester.

Multicultural and Diversity Affairs

[Multicultural and Diversity Affairs](#)(352-294-7850) celebrates and empowers diverse communities and advocates for an inclusive campus.

Office of Student Veteran Services

[Office of Student Veteran Services](#)(352-294-2948 | vacounselor@ufl.edu) assists student military veterans with access to benefits.

ONE.UF

[ONE.UF](#) is the home of all the student self-service applications, including access to:

- [Advising](#)
- [Bursar](#)(352-392-0181)

- [Financial Aid](#) (352-392-1275)
- [Registrar](#) (352-392-1374)

Official Sources of Rules and Regulations

The official source of rules and regulations for UF students is the [Undergraduate Catalog](#) and [Graduate Catalog](#). Quick links to other information have also been provided below.

- [Student Handbook](#)
- [Student Responsibilities](#), including academic honesty and student conduct code
- [e-Learning Supported Services Policies](#) includes links to relevant policies including Acceptable Use, Privacy, and many more
- [Accessibility](#), including the Electronic Information Technology Accessibility Policy and ADA Compliance
- [Student Computing Requirements](#), including minimum and recommended technology requirements and competencies.

DISCLAIMER

All aspects of course operations, including grading scale, points distribution course policy, and policy execution, are subject to change at the discretion of the course instructor at any time without notice.