

CHM 5305, Chemistry of Biological Molecules

FALL 2021

Professor Michael E. Harris

Office: 302F Chemistry/Chemical Biology Building (CCB)

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Lectures Tuesday and Thursday, Period 7 - 8 (1:55 PM - 3:50 PM)

Office hours Wednesday and Friday 12noon-1pm

Office- CCB 302F

If you have a conflict or have additional questions use Canvas/email correspondence or request individually scheduled appointments.

Course Objectives This course aims to review fundamental principles of general, organic, and physical chemistry that form the framework for understanding biochemical systems. The content is designed to introduce students to concepts, tools, and techniques commonly found in chemical biology, and advance their abilities to comprehend and apply these concepts to important research problems. Topics will include the chemistry, structures, functions, interactions, and techniques associated with DNA, RNA, proteins, glycans, polyketides, and terpenes. Students will also learn to analyze and interpret key concepts from primary literature and gain experience in oral and written scientific communication.

Textbooks *Introduction to Bioorganic Chemistry and Chemical Biology*, Van Vranken, D. and Weiss, G.

Optional *Lehninger Principles of Biochemistry*, Sixth or Seventh Edition, Nelson, D. L. and Cox, M. M.

Additional materials will be made available on the course e-Learning site (<http://elearning.ufl.edu>).

Class Schedule

[CHM5305 schedule - Fall 2021.pdf](#)

Grading

Letter grades will be curved with approximate grade ranges (subject to change):

A = >85	B+ = >75	C+ = >60
A- = >80	B = >70	C = >55
	B- = >65	C- = >50

There are 3 graded assignments for this course:

3 Exams = 25% each totaling 75%

Literature and Presentation = various assignments totaling 20%

Participation = 5%

Assignments

Exams: There will be 3 in-class exams (100 points each). The three exams are scheduled for **Sept 21, Oct 14, and Nov. 9**. Concepts covered on all exams will be cumulative, although they will emphasize the material presented after the previous exam. After each exam, grade distributions will be posted so that you will have a feel for your performance relative to others in the class as the semester progresses.

Literature Presentation: This component of the course is a multi-part assignment ending with an in-class presentation. The four assignments and presentation will be individually graded and combined to form your overall grade for this assignment. See the course schedule or course e-Learning site for assignment due dates. Student presentations will be scheduled during the final few class periods.

<u>Assignment</u>	<u>Points/Total % of Grade</u>
Pick a topic and paper	0/0%
Annotation list of jargon/abbreviations	10/2.5%
Describe main text figures	10/2.5%
Find and summarize 2 directly related papers	10/2.5%
Cover letter	10/2.5%
<u>Presentation</u>	<u>40/10%</u>

Details regarding each assignment can be found on the course e-Learning site.

Late submission of assignments will result in the deduction of points. The respective grade will be reduced by 30% if submitted late and within 24 hours of the deadline. Each subsequent day late will result in an additional 10% deduction. The instructor may waive the late penalty to a student who presents legitimate circumstances. There is no excuse for failing to communicate prior to the deadline.

Participation: Participation will be graded throughout the semester (20 points total). Your participation grade will be assessed based on your attentiveness during lectures and student presentations, and involvement during in-class polling, question sessions, and group discussions.

Practice problems: I will recommend practice problems from textbooks and previous course materials. These will not be collected or graded. They are provided to facilitate thinking about the concepts discussed in class and give examples of types of exam questions.

Class Attendance: 100% attendance either in person or by ZOOM is expected but not graded; however, participation is graded. Excused absences are consistent with university policies in the undergraduate catalog and require appropriate documentation (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>). All lectures, class activities, and office hours will be presented simultaneously live on Zoom at the link provided, above. Note there are no class activities that cannot be completed remotely by ZOOM for full course credit.

Make-Up Work: Make-up exams or presentations will only be allowed under extremely rare circumstances. All make-up work will need to be planned far in advance.

Course Evaluation: 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 at <http://gatorevals.aa.ufl.edu/students/>. 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 <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Class Demeanor: Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Opinions, questions, and answers given by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Zoom Demeanor: The participation portion of your grade for this class will be calculated on the basis of your attendance and your participation in class activities. Since the pedagogical approach of this course depends heavily on student engagement and interaction, you are required, at a minimum, to participate in class activities through the audio function of Zoom. Your video presence is invited as well to enhance instructor–student and student–student engagement.

Avoid the use of other distracting media during class and mute yourself if there is background noise that will be distracting to your fellow students. Class sessions will not be recorded and comments in the “chat” feature will not be recorded or shared. Unauthorized recording and unauthorized sharing of class sessions is prohibited.

Academic Honesty: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students 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.”

Diversity and Inclusion: We believe in equality for all and we welcome all ethnicities, races, genders, sexual orientations, cultures, faiths, ages, disabilities, and identities with respect. Each student is unique and brings their individual perspectives to our classroom and program. We are committed to maintaining an inclusive environment where each student is welcomed, respected, and supported during their educational and scientific journey.

Students with Disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Additional Information: Your well-being is important to the University of Florida. The *U Matter, We Care* initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the *U Matter, We Care* Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352.392.1575. The *U Matter, We Care* Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness

Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

COVID POLICY

In response to COVID-19, the following practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- **If you are not vaccinated, get vaccinated.** Vaccines are readily available at no cost and have been demonstrated to be safe and effective against the COVID-19 virus. Visit this link for details on where to get your shot, including options that do not require an appointment: <https://coronavirus.ufhealth.org/vaccinations/vaccine-availability/>. Students who receive the first dose of the vaccine somewhere off-campus and/or outside of Gainesville can still receive their second dose on campus.
- **You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.** Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.
 - Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
 - Hand sanitizing stations will be located in every classroom.
- **If you sick, stay home and self-quarantine.** Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
 - 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.
 - If you are withheld from campus by the Department of Health through Screen, Test & Protect you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- **Continue to regularly visit coronavirus.UFHealth.org and coronavirus.ufl.edu for up-to-date information about COVID-19 and vaccination.**

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CHEMISTRY OF BIOMOLECULES				
CHM5305	Classroom FLINT 50			
DATE	SUBJECT	ACTIVITY/PAPER	ASSIGNMENT	RECOMMENDED PROBLEMS
week 1	24-Aug T What is Chemical Biology?	Paper: Two Cultures		Ch1: 4,5,11
	25-Aug R Fundamentals/Origins	Paper: Decade of Chem Biol	Assignment: Select Topic	Ch2: 1-11,14-18,20,21
week 2	31-Aug T Fundamentals/Origins			Ch2: 12,13,24-29,33,34
	02-Sep R Fundamentals/Origins	Activity: Literature Search	Assignment: Select Paper	Ch3: 1,3-7,9,10,12,13,16
week 3	09-Sep T DNA			Ch3: 25,26,29,36,50,54
	11-Sep R DNA	Activity:NCBI/BLAST		Ch4: 1-3,6,11,12
week 4	14-Sep T RNA	Paper: Synthetic Genome		Ch4: 14-18,20,22,25-27
	16-Sep R RNA	Activity:Plasmid Maps/Cloning	Assignment 1: Jargon	
week 5	21-Sep T EXAM 1			Ch5: 1-4,6,8,11,13-16
	23-Sep R Protein Structure	Activity: PDB		Ch5: 18,24,28,30,34,35
week 6	28-Sep T Protein Synthesis		Assignment 2: Figures	
	30-Sep R Protein Function: Bioorthogonality	Activity: BLAST/UniProt		Ch6: 19,20,23,25,28,29
week 7	05-Oct T Protein Function: Enzyme Kinetics			
	07-Oct R Protein Function: Mechanisms	Paper:P450 Switch		
week 8	12-Oct T Protein Function: Mechanisms	Activity: ChimeraX	Assignment 3: Related Papers	
	14-Oct R EXAM 2			
week 9	19-Oct T Glycobiology			Ch7: 1-3,5,7,11,13,14
	21-Oct R Glycobiology			Ch7: 20,22,23,32,33
week 10	26-Oct T Lipids/Membranes	Paper:GlycoRNAs	Assignment 4: Cover Letter	Ch8: 2,8,10
	28-Oct R Polyketides			Ch8 11,12,15,16,26,31
week 11	02-Nov T Terpenes/Signal Transduction	Paper: Terpene Mechanism		Ch8: 19,20,22,32-35,40,41
	04-Nov R Flex Day			Ch9: 2-4,6,8,16,20,30A,34,35
week 12	09-Nov T EXAM 3			
	11-Nov R <i>Homecoming</i>			
week 13	16-Nov T Student Presentations			
	18-Nov R Student Presentations			
week 14	23-Nov T Student Presentations			
	24-Nov R <i>Thanksgiving Break</i>			
week 15	30-Nov T Student Presentations			
Finals Week				