



## CHEMISTRY 7470 / 5470 SYLLABUS

Spring Semester 2020

M, W, F 8:20-9:25 AM; HEB 2006

**Instructor:** Dr. Ming Chen Hammond, CSC 224B

**Phone Number:** (801) 213-0892

**Email:** [mingch@chem.utah.edu](mailto:mingch@chem.utah.edu)

**Office Hours/Discussion:** To be scheduled after student poll

**Office Location:** CSC 224B

### Course Description (from the Course Catalog)

Three lectures, one optional discussion per week for 8 weeks. Topics include chemical synthesis of DNA and RNA, nucleoside and oligomer analogs, chemistry of DNA damage and repair, nucleic acid-targeted drugs and binding agents.

**Prerequisites:** Organic Chemistry (2 semester) and Biochemistry (1 semester).

**Textbook (on Canvas):** Nucleic Acids in Chemistry and Biology, Editors: G. Michael Blackburn, Michael J. Gait, David Loakes, David M. Williams

### Schedule of Topics

WEEK	DATES	TOPIC
1	Feb 26	Course Introduction and Syllabus; Basics of Nucleic Acids
	Feb 28	Gene Regulation
2	Mar 2	Gene Expression
	Mar 4	Unnatural AA Incorporation
	Mar 6	Unnatural AA Incorporation
3	Mar 9	No Lecture – SPRING BREAK
	Mar 11	No Lecture – SPRING BREAK
	Mar 13	No Lecture – SPRING BREAK
4	Mar 16	Oligonucleotide Synthesis
	Mar 18	Natural and Unnatural Nucleic Acid Modifications
	Mar 20	Natural and Unnatural Nucleic Acid Modifications
5	Mar 23	Targeting Nucleic Acids
	Mar 25	<b>Guest Lecture</b>
	Mar 27	Exam 1 Review
6	Mar 30	<b>In-Class Exam 1</b>
	Apr 1	Targeting Nucleic Acids
	Apr 3	High-Throughput Sequencing
7	Apr 6	High-Throughput Sequencing

	Apr 8	Profiling with Sequencing
	Apr 10	Profiling with Sequencing
8	Apr 13	Emerging Nucleic Acid Technologies: Genome Editing
	Apr 15	Emerging Nucleic Acid Technologies: Biosensing
	Apr 17	Exam 2 Review
9	Apr 20	<b>In-Class Exam 2</b>

### Course Outcomes

- Students will gain and demonstrate an understanding of research strategies and methods of data analysis employed in the field of nucleic acid chemistry
- Students will apply background concepts from biochemistry and organic chemistry
- Students will practice reading, searching, and evaluating primary literature

### Course Policies

- 1. Course Website.** Important announcements, information, files, assignments, and grades will be posted on Canvas. Please enable receiving Canvas announcements via email.
- 2. Office Hours.** After taking a student poll during lecture 1, Prof. Hammond will schedule office hours slots starting in Week 2.
- 3. Preferred Method of Communication.** The most preferred method of communication is for students to speak with Prof. Hammond in person during office hours. The next preferred method of communication is via email: you must include "Chem 7470" or "Chem 5470" in the subject line. Please feel free to address the email to "Ming" or "Prof. Hammond", whichever makes you comfortable, but please don't leave out my name – as my son likes to say, "Hey" is for horses.
- 4. Course Assignments.** See detailed schedule for expected due dates

Assignment Types	#	Points each	Points total
Problem Sets	5	40	200
Lit Searches	6	20	120
Student Lit Problem	1	100	100
Oral Presentation (7470 ONLY)	1	100	100
Exams	2	200	400
Class Participation	*		80*
<b>TOTAL</b>			<b>1000</b>

\*Class participation includes lecture activities, paper discussions, and office hours / discussion sections. Students with exemplary participation in class will earn a round-up for their grade, if they are 'on the bubble'.

- 5. Late Policy.** Lit quizzes and searches cannot be made up if late. Students who must miss one problem set due to a family or health emergency will get a pro-rated score; a second miss will count as a zero. Students can request an extension for the reports due to a family or health emergency. Students who miss their scheduled oral presentation or the final exam due to a family or health

emergency will have to present or take an oral exam by appointment with Prof. Hammond. There will be no written make-up exam.

6. **An Environment Conducive to Learning.** All students are expected to maintain professional behavior in the classroom, according to the Student Code. Disruptive behaviors that include talking, cell phone use, and excessive tardiness will not be tolerated and will result in dismissal from the class.

## University Policies

1. **The Americans with Disabilities Act.** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.
2. **University Safety Statement.** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu).
3. **Addressing Sexual Misconduct.** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).
4. **Student Code.** By submitting an assignment or laboratory report, you are representing that it is your own work and that you have followed the rules associated with the assignment. Incidents of academic misconduct (including cheating, plagiarizing, research misconduct, misrepresenting one's work, and/or inappropriately collaborating on an assignment) will be dealt with severely, in accordance with the Student Code (<http://www.admin.utah.edu/ppmanual/8/8-10.html>). A single instance of academic misconduct may result in a failing grade for the course. Multiple instances of academic misconduct may result in probation, suspension or dismissal from a program, suspension or dismissal from the University, or revocation of a degree or certificate.
5. **Wellness Statement.** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, substance-abuse, etc., can interfere with a student's ability to succeed and thrive. For helpful resources

contact the Center for Student Wellness at [www.wellness.utah.edu](http://www.wellness.utah.edu) or 801-581-7776.

6. **Undocumented Student Support Statement.** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit [dream.utah.edu](http://dream.utah.edu).
7. **Student Names and Personal Pronouns.** “Preferred first name” (if previously entered by you in the Student Profile section of your CIS account, which can be managed at any time). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class or on assignments. Please advise me of any name or pronoun changes so I can help create a learning environment in which you, your name, and your pronouns are respected. If you need any assistance or support, please reach out to the LGBT Resource Center at [https://lgbt.utah.edu/campus/faculty\\_resources.php](https://lgbt.utah.edu/campus/faculty_resources.php).
8. **Veterans Center.** If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5 pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class for any reason.
9. **English Language Learners.** If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center (<http://writingcenter.utah.edu/>); the Writing Program (<http://writing-program.utah.edu/>); the English Language Institute (<http://continue.utah.edu/eli/>). Please let me know if there is any additional support you would like to discuss for this class.
10. **Diversity and Inclusivity Statement.** Course instructors are dedicated to maintaining a classroom environment and dialogue that facilitates intellectual and personal growth for **all persons**. The diversity that students bring to this class is viewed as a resource, strength, and benefit. Students are encouraged to contact the instructor(s) if they feel diversity and inclusivity is being compromised, or with suggestions to improve inclusivity.

*Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.*