

LOYOLA UNIVERSITY CHICAGO
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

**CHEM 396/465: SPECIAL TOPICS IN BIOCHEMISTRY:
BIOCHEMICAL APPLICATIONS OF MODERN OPTICAL SPECTROSCOPY
SYLLABUS, FALL 2020**

Instructor: Dr. Joerg Zimmermann e-mail: jzimmermann@luc.edu
Office Hours: Friday 10 AM to 12 PM via Zoom phone (cell): (858) 405 7026
(link on course website) Web Page: sakai.luc.edu

COURSE DESCRIPTION

This course will survey theoretical foundations and practical applications of modern optical spectroscopy, including the quantum-mechanical description of light-matter interactions in organic molecules, different methods of steady-state and time-resolved optical spectroscopy, and literature examples of their application in biochemical research. The goal of this course is to give students the tools to be able to critically interpret spectroscopic data in the literature.

PREREQUISITES/COREQUISITES

Satisfactory progress toward completion of the core chemistry courses, and Junior or Senior status. Restricted to BIOCHEM and CHEM majors.

COURSE FORMAT

One synchronous online lecture (Tu 5:30 PM-6:45 PM, link on course website) and one asynchronous online lecture per week.

PREFERRED NAME AND GENDER PRONOUN

This course affirms people of all gender expressions and gender identities. If you prefer to be called a different name than what is indicated on the class roster, please let me know. Please correct me on your preferred name and gender pronouns. If you have any questions or concerns, please do not hesitate to contact me.

OFFICE HOURS

Office hours are for those with questions, who seek advice, want to share and/or provide feedback. You can “walk in” or make an appointment ahead of time. Discussion can be about this class and beyond – office hours are for EVERYONE. We can talk about college life in general, class work, class issues, questions you might have, your academic plans, schedules, grades, a letter of recommendation you may need, or general questions or concerns. If you are unable to attend the regular office hours, I am happy to meet at a time that works for you, just ask me (either in person or via email).

As family matters, assignments, essays, and tests in all of your courses demand your attention, there could be moments when you need assistance. If you are experiencing difficulties inside or outside the classroom that may affect your performance in this course, I WANT TO HEAR ABOUT IT. I will do my best to accommodate your specific needs to help you succeed.

COMMUNICATION OUTSIDE OF CLASS TIME AND OFFICE HOURS

Course-related communications between you and me should be conducted using the Loyola email system. Check your email often, AT LEAST ONCE A DAY. Avoid using personal email accounts, I may not receive those emails due to spam filters. When appropriate, you can also call or text me at my cell-phone number: (858) 405 7026.

CAMPUS RESOURCES

Loyola University is dedicated to helping students succeed in their education endeavors. There are many resources to assist you with your online courses. You can find brief descriptions of the various types of support with links to the respective pages, as well as quick links to each, at <https://www.luc.edu/online/resources/index.html>.

CLASS BEHAVIOR EXPECTATIONS

We strive for a learning environment of equity, respect and inclusiveness. Therefore, all of us are expected to follow these basic principles:

- Demonstrate respect for oneself and for others.
- Treat others with dignity and behave in a way which promotes a physically and psychologically safe, secure, and supportive climate.
- Allow all community members to engage as full and active participants where the free flow of ideas is encouraged and affirmed.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

If you require special accommodations due to a disability, documented or not, and are comfortable sharing this information with me, please do so at your earliest convenience. In addition, the university provides services for students with disabilities. Any student who would like to use any of these university services should contact the Student Accessibility Center located in Sullivan Center (phone: 773-508-3700, email: sac@luc.edu). Note that certain academic accommodations afforded to students, e.g. additional time on exams, require documentation and review. Further information is available at <https://www.luc.edu/sac>.

COURSE MATERIALS

All texts to be used in the course will be available as e-book through the library or for download from the course website.

OPTIONAL SUPPLEMENTAL TEXTBOOKS

1. Cantor and Schimmel: *Biophysical Chemistry, Part 2: Techniques for the study of biological structure and function* (ISBN 978-0716711902)
2. Klessinger and Michl: *Excited states and photochemistry of organic molecules* (ISBN 978-0471185765)

ACADEMIC CALENDAR

You are responsible for understanding all processes and timelines associated with dropping or withdrawing from this course, file for a PASS/FAIL conversion etc. The Loyola University Chicago academic calendar that lists important dates and deadlines for the semester can be found at <https://www.luc.edu/academics/schedules>.

EXAMS

- **Midterm Exam:** There will be one midterm exam, tentatively scheduled to take place on October 6 in class.
- **Final Exam:** The Final Exam will take place on Tuesday, December 8, 5:30 PM - 7:30 PM. The final cannot be rescheduled except with verifiable proof of serious illness or a police report, or if you have four or more final exams scheduled for the same day, in which case you can petition to the Assistant Dean for Student Academic Affairs in the College of Arts and Sciences for rescheduling.
- If you for any reason require special accommodations during an exam, contact me WELL BEFORE the exam. The day of the exam is too late.

LATE/MISSED WORK

- If you miss deadlines or exams for valid reasons (emergencies related to family, medical, legal or immigration issues) you must contact me by email within 48 hours of the exam to avoid failing the exam. In case of illness, a doctor's note is required.
- Assignment deadlines are firm. Assume that technology will fail sometimes. Do not assume that everything will go smoothly when it comes to computers. Plan ahead. Do not leave completion/submission of assignments to the last possible moment.

ACADEMIC INTEGRITY

Before beginning, let me state EMPHATICALLY that I firmly believe that 99.9% of my students (if not 100%) are basically honest people. I also know that the pressures of school, grades, family, etc. can be overwhelming at times and can lead to choices one would not normally make. That said, I view violations of Academic Integrity as a very serious offense against your fellow students and against the integrity of the university, as well as a personal affront to me. There will be zero tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to my attention. If caught, I will pursue disciplinary action against all parties TO THE FULLEST EXTENT POSSIBLE; this may include lowering of grades, failure, suspension or expulsion.

Academic dishonesty can take several forms, including, but not limited to cheating, plagiarism, copying another student's work, and submitting false documents. All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed here: <http://www.luc.edu/cas/advising/academicintegritystatement>

A basic mission of a university is to search for and to communicate the truth, as it is honestly perceived. A genuine learning community cannot exist unless this demanding standard is a fundamental tenet of the intellectual life of the community. Students of Loyola University Chicago are expected to know, to respect, and to practice this standard of personal honesty.

Any instance of dishonesty (including those detailed on the website provided above or in this syllabus) will be reported to the Chair of The Department of Chemistry & Biochemistry who will decide what the next steps may be. Dishonest behavior such as any form of cheating may cause to fail (grade = 0 or "F") an assignment, examination, or the course, depending the severity of the case. That grade assigned because of cheating cannot be "dropped".

GRADING STANDARDS AND POLICIES:

You will be evaluated based on the following:

1. course participation	300 pts	(30%)
2. literature review and student presentations	300 pts	(30%)
3. midterm exam	200 pts	(20%)
4. final exam	200 pts	(20%)
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TOTAL ACHIEVABLE POINTS	1000 pts	(100%)

The following grading standards will be used (based on TOTAL points achieved):

A 910 pts and up	B + 810 – 859 pts	C + 660-709 pts	D 500 – 569 pts
A – 860 – 909 pts	B 760 – 809 pts	C 610 – 659 pts	F 499 pts and below
	B – 710 – 759 pts	C – 560 – 609 pts	

Course participation points are awarded for in- or out-of-class activities, with special emphasis to promote participation in the asynchronous course content. There will be opportunity for approximately 350 course participation points, however, **course participation points max out at 300 pts**, i.e. you can achieve full points even if you miss a few assignments. All graded activities and their deadlines will be posted on the course website. Make sure you check there often and regularly as new assignments will be posted throughout the semester.

Literature review and student presentations: In the last third of the semester, each student will submit written summaries of several journal articles and give one oral presentation about one of them. Written and oral presentations will be evaluated on both content and style. A selection of journal articles, detailed instructions, and grading criteria will be posted by the instructor on the course website.

ACADEMIC GRIEVANCES AND ACADEMIC APPEALS POLICIES

Students have the right to protection against arbitrary and capricious academic evaluations. Arbitrary and capricious means that there is no relation between the grade given and the student's performance in the class and that a reasonable person could not find that the grade was deserved. Mere disagreement or dissatisfaction with a grade does not constitute a basis for grievance. The procedure to resolve disputes can be found at: https://www.luc.edu/academics/catalog/undergrad/reg_academicgrievance.shtml.

Students also have the opportunity to request a review of circumstances that impact their academic standing or progress at the University. For example, you can appeal for a change in academic record, a finding of academic misconduct, a decision related to transfer credit, or a dismissal for poor scholarship. The procedure to request reviews can be found at <https://www.luc.edu/academics/catalog/undergrad/academicappeals>.

COPYRIGHT OWNERSHIP IN COURSE MATERIALS

My lectures and course materials, including presentations, tests, exams, outlines, and similar materials, are protected by copyright. I am the exclusive owner of copyright in those materials I create. I encourage you to take notes and make copies of course materials for your own educational use. However, you may not, nor may you knowingly allow others to reproduce or distribute lecture notes and course materials publicly without my expressed written consent. This includes providing materials to commercial course material suppliers such as CourseHero and other similar services.

PHOTOGRAPHS, AUDIO OR VIDEO RECORDINGS

Any photographs taken or audio or video recordings of this course or materials of this course made by you are for the students' personal academic use only and may not be distributed in any manner (to any other individual or to the public) without written consent of the instructor (me).

In this class software will be used to record live class discussions. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the Sakai course is unpublished (i.e. shortly after the course ends, per the Sakai administrative schedule). Students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Please discuss this option with your instructor.

The use of all video recordings will be in keeping with the University Privacy Statement shown below:

Privacy Statement

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.

Course Repeat Rule

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website: <http://www.luc.edu/chemistry/forms/> and personally meet and obtain a signature from either the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):

Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and to receive notes or other written information distributed in the missed classes.

Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation (develop standard form on web) describing the reason for and date of the absence. This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time.

Accommodations for Religious Reasons

If you have observances of religious holidays that will cause you to miss class or otherwise effect your performance in the class you must alert the instructor within 10 calendar days of the first class meeting of the semester to request special accommodations, which will be handled on a case by case basis.

DISCLAIMER

THIS SYLLABUS MAY BE AMENDED AND/OR ALTERED AT ANY TIME DURING THE SEMESTER AT THE DISCRETION OF THE INSTRUCTOR.

CHEM 396/465 Course Schedule FALL 2020 (tentative)*

Week	Dates	Synchronous Lecture	Asynchronous Lecture
1	8/25	introduction	some quantum mechanics
2	9/1	some quantum mechanics	vibrational spectroscopy
3	9/8	vibrational spectroscopy	electronic transitions
4	9/15	electronic transitions	absorption spectroscopy
5	9/22	absorption spectroscopy	emission spectroscopy
6	9/29	emission spectroscopy	midterm review
7	10/6	midterm exam	FRET, single-molecule spectroscopy
8	10/13	FRET, single-molecule spectroscopy	time-resolved spectroscopy: pump-probe
9	10/20	time-resolved spectroscopy: pump-probe	time-resolved spectroscopy: photon echo
10	10/27	time-resolved spectroscopy: photon echo	time-resolved spectroscopy: 2D-IR, 2D-UV/vis
11	11/3	time-resolved spectroscopy: 2D-IR, 2D-UV/vis	literature review
12	11/10	student presentations	literature review
13	11/17	student presentations	literature review
14	11/24	THANKSGIVING BREAK NO CLASS	THANKSGIVING BREAK NO CLASS
15	12/1	student presentations	final review
FINAL WEEK	12/8	FINAL EXAM Tuesday, 12/8, 5:30 PM – 7:30 PM	

* PLEASE NOTE THAT THE SCHEDULE IS APPROXIMATE WITH RESPECT TO COVERAGES; WE MAY GET BEHIND OR AHEAD AS THE SEMESTER PROGRESSES. YOU ARE RESPONSIBLE FOR EVERYTHING SAID IN LECTURE, EVEN IF YOU MISS CLASS.