

BIOORGANIC CHEMISTRY – CHEM 4410 003 (CRN: 95497) Fall 2021
BIOORGANIC CHEMISTRY – CHEM 6410 003 (CRN: 95498) Fall 2021

Aug 23, 2021 – Dec 14, 2021

Spectrometric Identification of Organic Compounds, Fall 2021

12:30 – 1:45 pm WF Classroom South 508

Instructor Information

Course Instructor: Dr. Kostiantyn O. Marichev, Assistant Professor

Email: kmarichev@gsu.edu

Office Hours: Webex/In person meetings by appointment (**MWF** 10:30am – 12:00pm).

Course Information

This is a face-to-face course

Credit Hours: 3

Required Textbook:

Spectrometric Identification of Organic Compounds, 8th Edition. Authors: Robert M. Silverstein, Francis X. Webster, David J. Kiemle, David L. Bryce. ISBN: 978-0-470-61637-6, published September 2014, 464 Pages. Ebook rental for 120 days cost = \$54.00.

<https://www.wiley.com/enus/Spectrometric+Identification+of+Organic+Compounds%2C+8th+Edition-p-9780470914014>

Optional Solutions Manual:

Spectrometric Identification of Organic Compounds 7th Edition by Robert M. Silverstein, Francis X. Webster, David J. Kiemle, David L. Bryce. 2005.

Lecture Logistics:

12:30 – 1:45 pm WF Classroom South 508

Description of the Course

CHEM 4410/6410

Prerequisite: A grade of “C-” or better in CHEM 2400 (Organic Chemistry I) and CHEM 3410 (Organic Chemistry II).

Description: In this graduate/senior undergraduate level course, students will learn the fundamentals of UV-Visible, IR, X-ray, optical activity, one, two dimensional and multinuclear NMR spectroscopies. A major emphasis will be on problem solving and critical analysis; students will be exposed to a variety of real world examples and taught different methods to solve them. The expectation is that students will become experts in spectrometric identification and structural characterization of organic compounds.

The course will consist of three (3) hours of lecture per week. There will be at least five unannounced quizzes in the lectures accounting for 100 points (equivalent to that from a one hour exam) of the final course grade, so **attending lectures is an expectation**. Major assessments will include three (3) hour exams (100 points each) in addition to the quiz total for a total of four 100-point evaluations, of which you will count your highest three for a point total of 300 points.

Fall 2021 final exam schedule has not yet been finalized! The exam schedule will eventually be announced and also posted at:

<https://registrar.gsu.edu/registration/semester-calendars-exam-schedules/>

Teaching fundamental concepts of the course is planned for face-to-face meetings. Selected lectures that will include specific examples and problem solving will be planned for synchronous meetings via Webex (TBA).

Course Outcomes

Successful students will learn a wide variety of spectroscopic methods essential for the structural analysis of organic molecules. Students will be able to use a combination of methods to unambiguously determine structures of complex molecules. Use of presented modern methods of structural determination to develop strategies to reach synthetic and analytical goals is expected.

Hour exams and quizzes will be based on material in the sections of the chapters listed below.

CHEM 4410/6410 Course Policies

Carefully read the information below and retain this document for future reference. Students will be held responsible for being aware of the class policies contained herein.

Grading

Final grades will be based on exam/quiz performance:

Quizzes (20 pts. each x 5)	100 points
Hour Exams (2 out of 3)	200 points
Quiz + Exam counted (3 out of 4)	300 points
Final Exam	100 points
TOTAL	400 points

Letter grades for the course will be assigned as follows: The cutoff point for an A grade will be 80% of the total points. The median score usually defines the B-/C+ cutoff, but this may vary. However, there is a score below which a passing grade (C- or above) cannot be justified. That line is normally 50% of the total points.

Extra credit for **CHEM 4410/6410** is not available except if given in Hour Exams or Quizzes.

Last Day to **Withdraw** and receive a **W** is **October, 12 2021** (Semester Midpoint).

Important!

Passing grade for graduate students is **B- and above**

Passing grade for undergraduate students is **C- and above**

Grade	Percentile
A+	95+
A	85-94
A-	80-84
B+	75-79
B	70-74
B-	65-69
C+	60-64
C	55-59
C-	50-54
D+	45-49
D	40-45
D-	35-39
F	0-34

Tentative Lecture Schedule:

<u>Day/Date</u>	<u>Material Covered</u>	<u>Reading (Chapter)</u>
W 8/25	Mass spectrometry	Chapter 1
F 8/27		
W 9/1	UV/Vis spectroscopy	Material will be provided
F 9/3		
W 9/8	Infrared Spectroscopy	Chapter 2
F 9/10		
W 9/15	X-ray Diffraction	Material will be provided
F 9/17	EXAM 1 (Chapters 1, 2)	
W 9/22	Proton (¹ H) Magnetic Resonance Spectroscopy	Chapter 3
F 9/24		
W 9/29		
F 10/1		
W 10/6		
F 10/8		
W 10/13		
F 10/15	EXAM 2 (Chapter 3)	
W 10/20	Carbon-13 NMR Spectroscopy	Chapter 4

F	10/22		
W	10/27		
F	10/29	Two-Dimensional NMR Spectroscopy	Chapter 5
W	11/3		
F	11/5		
W	11/10		
F	11/12		

W 11/17 EXAM 3 (Chapters 4, 5)

F	11/19	Multinuclear Magnetic Resonance Spectroscopy	Chapter 6
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Thanksgiving Break

W	12/1	Multinuclear Magnetic Resonance Spectroscopy (Solving Problems)	
F	12/3	Optical Methods of Analysis	Material will be provided

TBA **Final Exam (2.5 hours)**
(12/7-14)

Assessments

In-Class “Hour” Exams: The exam dates are as listed on the lecture schedule. The exams will start promptly, and will end after 70 minutes. At the end of the exam’s 70-minute period, all papers will be collected. Students who arrive late will NOT be allowed to continue after the end of the period. Each exam will consist of spectroscopy problems; details will be given in class. Hour exams will, for the most part, cover material listed on the class schedule. There are, however, many aspects of spectroscopy that are basic principles and are widely applicable, so do not assume that material covered by one exam can be forgotten until the final. Graded exams will be distributed in class during the week following the exam. The final exam is a comprehensive exam that will be given at the date and time dictated by the final exam schedule.

The highest exam scores from three “hour” exams will be used in the calculation of your final grade. In other words, if you take the scheduled three exams and the quizzes, you can drop the one set having the lowest score. If for any reason you do not take one of the three hour exams, ***there will not be a make-up exam.***

Exams will be closed book; do not consult books, notes, electronic devices, other students, desk graffiti, and so forth during an exam. A calculator and some provided tables might be used during a **CHEM 4410/6410** exam only if necessary (TBA). Those found using any device other than their own mind or copying from another student to answer an exam or quiz will be given a zero grade for that exam/quiz and reported.

In-Class Quizzes: ***Quizzes will be given at unannounced times during lectures.*** The quizzes will test your awareness and comprehension of subjects covered prior to the quiz. Each quiz will be 20–25 points, and the highest point total from five quizzes will be

recorded. At least six quizzes will be given, so you will have the opportunity to drop your lowest individual quiz score(s) if you take all quizzes; **there is no makeup quiz** if you miss one or more of the quizzes. Clickers are not intended to be used in this course.

Course Policies of Note

General Policies

1. The use of electronic devices during class is strictly prohibited. That includes (but is not limited to) cell phones, iPods/CD players, iPhone's/PDA's, Blackberry, etc. However, laptops and pads for note taking are allowed, except during exams.
2. It is the student's responsibility to be on time for class.
3. **It is the student's responsibility to drop the course if he/she wishes to do so.** You will not be automatically dropped from class. The drop date for the Fall 2020 semester to receive a **W** is **October 12**. Failure to drop by the corresponding deadline will result in an automatic "F" in the course if the student stops attending and/or fails to complete the course work.
4. University policy does not permit visitors in class.
5. University policy does not permit faculty or office staff to report grades by telephone, fax, or email.
6. The course's content will be provided through GSU iCollege <https://icollege.gsu.edu/>. Be sure to check your browser in advance to verify that you have the proper setting to be able to access all the posted material. As soon as possible I will post in iCollege course material that is not covered in the textbook.

Communications

The use of email is encouraged for all course related communication. Email me at kmarichev@gsu.edu. I try to respond to email within 2 business days and normally do not respond after 7 pm or on weekends. Also, be aware that I will not respond to emails that are written in the 12 hours leading up to an exam. In addition, asking questions on items covered in the syllabus will be given very low priority – *read the syllabus and course policies*.

Emergency Procedures

In the event of a campus closure or other emergency, I will communicate with the class via iCollege as soon as decisions are made. Should a campus closure and a major assessment coincide, the missed exam will be given on the earliest possible date following the reopening of campus or given online. Details and logistics will be communicated via iCollege.

Email Etiquette

Although there is no campus-wide policy concerning email between students and faculty, a growing consensus on the part of faculty is emerging as to how students should compose emails to faculty. I have the expectation that my students will follow the rules below.

1. There should be a proper salutation; Dear Dr. or Prof. Marichev. You should not address me by my first name or as "Dr. M".
2. Use complete sentences with punctuation and capitalization. I do not text message.

3. Conclude the email with your FULL NAME and University ID NUMBER. If name@gmail.com sends an email to me with no additional identifying information, he/she will not get a response.

4. Do not send a laundry list of exhaustive questions, especially if the answers are best given in the form of chemical structures. That is what office hours are for.

Missed Exams

As required by University regulations, students who miss an hour exam due to a University-recognized situation will be given an opportunity to take that exam prior to the scheduled exam date or to drop that exam (not counted towards the 300-point total). There is no makeup for quizzes. For an excused absence from taking an hour exam ALL of the following conditions MUST be fulfilled: 1) The missed exam is the result of an University approved excuse; 2) Dr. Marichev must be notified IN WRITING (email is preferred) of the missed exam prior to the scheduled date for that exam; 3) Within five (5) days after the missed exam, you must provide written and verifiable documentation of the excuse. 4) Within 5 days of your notification, attend Dr. Marichev's office hours to discuss the procedure.

Exam Regrades

If an exam question is graded in error, or if there is a clerical error, exams can be submitted directly to Dr. Marichev for regrading. Do not change your exam in any way. Deliver the exam directly to Dr. Marichev. NOTE: Regrade submission deadlines WILL NOT be extended for students who pick up their exams late. Exams filled out in pencil or other erasable media will not be regraded.

NOTE: In the case of student-perceived grading errors or point assignment, the entire exam will be regraded, not just the problem in question.

NOTE: Prior to return of exams, a considerable number of the exams, perhaps all, will be photocopied. Modification of an exam prior to submission for a regrade is a serious violation of the University Honor Code. Any regrade submission that raises suspicions will be compared to its photocopy. Variations will be referred to Student Conduct.

Course-Specific Honor Code Issues

In a competitive course like **Spectrometric Identification of Organic Compounds**, it is vital that every student feels that his/her efforts have been treated and evaluated exactly like those of every other student; and that the course evaluation mechanism is universal and fair. Significant effort has been expended to ensure that every student has the same opportunity to learn the material and that the evaluation mechanism is universally applied.

Unfortunately, every semester, in attempts to gain an unfair advantage over their classmates, a small number of students engage in activities that are prohibited by class regulations and/or [University Academic Policy](#). These students pay a heavy price for actions that often have little or no benefit had they gone undetected. In chemistry courses, repeat offenses include alteration of an exam prior to requesting a regrade (see Regrades, above), falsification of excuse documentation (see Missed Exams, above), and improper in-exam activities (see Examinations, above). Each of these activities,

along with others, is remarkably easy to detect. No matter what the situation, students do themselves no favors by engaging in activities that are outside the rules, and the negative consequences can be life-long.

Success in CHEM 4410/6410

General

CHEM 4410/6410 is widely regarded as a difficult class. Students who are successful in the course generally do all the following: (1) Attend all of the lectures and discussion sessions. (2) Read material ahead in the book and check iCollege. (3) Devote a significant amount of time on a regular basis to studying for the course; students who start studying a few days before an exam rarely do well. (4) **Most importantly, do lots of problems** (see below).

Doing Problems

Experience has shown that there is a direct correlation between exam scores and number of book problems worked. This cannot be over stated; you should do as many problems as possible, and then do some more. However, these problems will neither be collected nor graded. Neither will they be all inclusive; students are expected to independently work enough problems to gain mastery of the material. Some fraction of exam questions may be drawn from problems contained in the text but **rote memorization of material in the text will not ensure a high grade.**

Special Needs

Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Students with special needs should then make an appointment with me during the first week of class to discuss any accommodations that need to be made.

Highly Important!

All information and updates regarding GSU COVID-19 policy can be found here:

<https://covidinfo.gsu.edu/>

Please read thoroughly to ensure our safety on campus and in classrooms.