

ORGANIC CHEMISTRY

Lecturer: Mas Iimura, PhD

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Office Hours Info:

Office Hour Zoom: <https://santarosa-edu.zoom.us/j/97409867587>

or by text: (415)761-1233

M: 10:30 am ~ 11:00 am (drop-in); 3:15 pm ~ 3:45 pm (by appointment)

T: 10:30 am~11:15 am (drop-in); 11:15 am ~ 12:00 pm (by appointment)

W: 10:30 am ~ 11:00 am (drop-in); 3:15 pm ~ 3:45 pm (by appointment)

Th: 10:30 am~11:15 am (drop-in); 11:15 am ~ 12:00 pm (by appointment)

OVERVIEW:

Welcome to CHEM 12B –2nd semesterr Organic Chemistry! I am passionate about organic chemistry! I truly hope that you find this course stimulating, challenging (in a good way), and rewarding, and that you find it as enjoyable as I do teaching this subject.

As the science that describes matter and its changes, chemistry is central in our understanding of many fields, from health to the environment to the design and evaluation of materials. The fact that all of biology and manufacturing deal with matter guarantees that chemical science will remain central to much of the human endeavor. Knowledge of organic chemistry is an essential foundation for your chosen discipline (chemistry, medicinal science, material science, engineering, pharmaceutical science, medicine, etc.)

CHEM 12A~12B is a demanding year-long organic chemistry course. Lecture topics in CHEM 12B, the 2nd semester Organic Chemistry, include:

1. Alcohols (cont'd)
2. Ethers, Epoxides and Related Sulfur Compounds
3. Catalysis
4. Radicals
5. Aldehydes and Ketones
6. Enols and Enolates
7. Carboxylic Acids and Carboxylic Acid Derivatives
8. Amines
9. Aromatic Compounds, Aryl Halides and Phenols
10. Heterocyclic Compounds

And time permitting:

11. Carbohydrates
12. Lipids
13. Amino Acids
14. Nucleic Acids

STUDENT LEARNING OUTCOMES (as stated in the official Course Outline of Record of SRJC.)

https://portal.santarosa.edu/SRWeb/SR_CourseOutlines.aspx?Semester=20213&CVID=49689

Students will be able to:

1. Propose a synthetic route, predict the mechanisms for each step in the synthesis, and perform the synthesis and purification of a specified product from a list of given starting materials, while following common safety regulations and procedures.
2. Use nuclear magnetic resonance (NMR), infrared (IR), gas chromatography-mass spectrometry (GC-MS), and/or ultraviolet-visible data to elucidate the structures of unknown compounds and known compounds, and evaluate the success of the synthesis of a specific compound.

Objectives:

Upon successful completion of this course, the students will be able to:

1. Name a wide variety of organic compounds.
2. Predict and explain relative physical and chemical properties for a wide variety of organic molecules.
3. Predict the products and describe the mechanisms for a wide variety of organic compounds using fundamental chemical principles.
4. Effectively communicate observations and subsequent conclusions by means of written laboratory reports.

GENERAL COURSE POLICY

***** DUE to the COVID-19 pandemic, all lectures for this course will be conducted via Zoom synchronously. *****

Zoom link for lectures: <https://santarosa-edu.zoom.us/j/93600734493?pwd=RFQwaDZVMlE5RG5aYitMdIEwZStnQT09>

Password: aldehyde

I. Prerequisites: Course Completion of CHEM 12A

II. Sections

Section 5671:

Lecture: Tues and Thurs 9:00 am~10:30 am

Lab: TTh 3:00 pm ~ 6:00 pm (**Lab Instructor: Prof John Branca)

Dr. Branca's Office Hours: Tuesday 3:00 to 5:00 PM Zoom online only (no in-person office hours due to public health conditions)

III. Course Materials:

REQUIRED:

- Textbook: Klein, D. *Organic Chemistry*, 3rd Ed. John Wiley & Sons, Inc., 2017.
ISBN: 9781119340522
- Lab Manual: Zubrick, James W. *The Organic Chem Lab Survival Manual: A Student's Guide to Techniques*, 11th Ed John Wiley & Sons, Inc., 2020
ISBN: 9781119608554

HIGHLY RECOMMENDED:

Molecular model kit. Any set would do.

Suggestion (available on Amazon)

- Organic Model kits from the HGS-Maruzen Model company

(<http://www.hgs-model.com/model/index.html>) Laboratory notebook

- For lab:
 - Lab notebook

For in-person labs:

Protective eye wear and apron must be used in the laboratory at all times as required by California State law.

IV. Attendance:

Attendance is **important and required** of all students. Attendance and attention are vital for your learning and success in this course. Please do not miss or be consistently late to the class. Excessive absences will result in a significant reduction in your course grade, and may lead to the student being dropped from the course completely. **THERE WILL BE NO MAKE-UPS ON LABS OR EXAMS FOR ANY REASON OTHER THAN A DOCUMENTED MEDICAL EXCUSE.**

MISSING MORE THAN TWO LABS WILL RESULT IN AN "F" FOR THE ENTIRE COURSE, REGARDLESS OF THE STUDENT'S PERFORMANCE IN THE CLASS.

V. Standards of Conduct:

All students shall adhere to the District Standards of Conduct. (<https://student-conduct.santarosa.edu/student-conduct-and-discipline-due-process>)

Inappropriate behavior in the classroom may result in a referral to the Vice President of Student Services for disciplinary due process.

(SRJC Acts of Misconduct can be found here: <https://student-conduct.santarosa.edu/acts-misconduct>)

There is a zero-tolerance policy regarding plagiarism in this course. All students are expected to do their own work. This does not preclude collaboration and group study, but it does mean that anything put to paper and turned in is expected to come from that student. Cheating, or anything that can be construed as cheating will result in no credit given, if not worse. Use of line resources or tutorial sites for exams and quizzes is considered cheating. There will be no inter-student communication during exams; any comments or questions are to be directed toward the instructor.

VI. Reading Assignments:

Lectures are designed to help you understand the material presented in the textbook. To get most out of the lecture, one should **ALWAYS** read the appropriate sections before they are discussed in class.

VII. Homework Assignments:

Homework is an important vehicle for study; working out the problems is one of the most effective ways to learn and study chemistry. On occasion, the assigned problem may be the source of an exam question!

VIII. Lab:

TO RECEIVE A PASSING GRADE IN THE COURSE, PASSING WORK MUST BE DONE IN BOTH THE LAB AND LECTURE PORTIONS.

There will be 4 in-person experiments (8 in-person lab meetings) for the Spring 2021 CHEM 12B. The in-person lab meeting dates are provided below.

Laboratory exercises are an integral part of the course. They are designed to provide you with a hands-on way to experience the chemical concepts discussed in the lecture.

- Before lab, read the experiment and do all the pre-lab questions.
- Arrive on time, properly dressed.
- Follow all lab safety regulations discussed.
- Turn in your lab reports. Late labs will be marked down by 20% of the value of the lab reports.

Attendance at laboratory sessions is mandatory. **PLEASE DO NOT MISS LABS.** No incomplete grades (I) will be given for missing labs. **In order to pass the course, no more than TWO (2) missing lab are allowed.**

At the beginning of the lab period, theoretical concepts, instructions, changes to the procedure, and safety precautions will be discussed. Your on-time attendance is required in order to safely and successfully perform the assigned laboratory experiment. A student who is tardy may be barred from the laboratory and receive a score of zero for that assignment.

You are expected to keep a Lab Notebook for both in-person and virtual labs. The Lab Notebook is an extremely important part of any laboratory experience, since it is the permanent record of what was done and what was observed. Thus, you will be graded on the quality of maintenance of your Lab Notebook.

The format of the **reports** required for most of the experiments appears in a separate document. Unless you have talked to me in advance, missed or late reports will receive a score of zero, regardless of the actual experimental work performed.

IX. Exams:

NO MAKE-UP EXAMS WILL BE GIVEN IN THIS COURSE. If an examination is missed, a score of zero will be recorded. Excused absence from an exam will be granted only if proper documentation is provided.

In the lecture portion of the course, there will be **3 exams and a final exam** (cumulative, ACS standardized exam) in the course.

There may be a **lab exam** in this course (to be announced later.) The lab exam, if given, will assess your knowledge and understanding of the chemistry and techniques of the performed experiments, as well as your awareness of safety procedures.

The dates of the exams and the final are provided below.

X. Accommodations for Students with Disabilities:

If you need disability-related accommodations for the class, please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to me as soon as possible. Also, please come see me during the office hour as soon as possible to discuss about the accommodations.

XI. Re-Evaluation of Graded Work: Graded work may be submitted for re-evaluation within one class period from when it was received. In comparing ones graded materials with that of fellow students, any difference must be confirmed by submission of both students' work for consideration. The document in question must be submitted with written detailed rationale for any changes requested. Based on this rationale, the entire assignment will be thoroughly evaluated. This re-evaluation can result in positive, negative, or no change to the original score.

XII. Grading: The weighing factors for the various types of assignments and percentage cutoffs are listed below:

Factors	Weights (%)
Lecture Exams	46 %
Take-home weekly quizzes (lowest will be dropped)	6 %
Homework	2 %
Lab Work (Reports/Notebook/assignments etc.)	21 %
Lab Paper	10%
Final Exams (ACS Standardized Final Exam)	15%

Final course letter grades will correspond to the following percentages:

100~87% **A** 86~78% **B** 77~ 63% **C** 62~ 50% **D** Below 49% **F**

XIII. Emergency Evacuation Plan:

In the event of an emergency during in-person lab meetings that requires evacuation of the building, please leave the class or the lab immediately, but calmly. We will meet in the open area between Bech Parking area to make sure everyone exited the building safely and to receive further instructions.

Copies of the red Emergency Preparedness Handbook are posted throughout the building and have more detailed information and procedures for most imaginable emergency situations. Any types of emergency can/should be reported to the district police dispatcher at (707) 527-1000.

XIV. Important Dates:

Jan 26 th , 2021	Last day to register/add without instructor's signature or add code
Jan 31 st , 2021	Last day to drop semester length class (eligible for a refund)
Feb 7 th , 2021	Last day to register/add with the instructor's signature or add Code
Feb 7 th , 2021	Last day to drop a class without "W" symbol
Feb 11 th , 2021	Mandatory Professional Development Activity Institutional Day (No classes)
Feb 12 th , 2021	Lincoln's Day Holiday (No Classes)
Feb 15 th , 2021	Washington's Day Holiday (No Classes)
Feb 28 th , 2021	Last day to opt for P/NP
Mar 22~28, 2021	Spring Break
April 25 th , 2021	Last day to drop a class with "W" symbol
April 22 nd , 2020	Earth Day 2021
May 22~28, 2021	Final Examinations

Other IMPORTANT dates:

Exam dates:

Exam #1 – Feb 25th, 2021

Exam #2 – Apr 6th, 2021

Exam #3 – May 6th, 2021

FINAL EXAM: May 27th, 2021 (Thurs) 7:00 am ~ 9:45 am **

**** The Final Exam will be a comprehensive standardized final exam **
(ACS Organic Chemistry Standardized Final Exam)**

In-Person lab dates:

Expt 4 – Tues Feb 16th, 2021 & Thurs Feb 18th, 2021

Expt 6 – Th Mar 11th, 2021 & Tues Mar 16th, 2021

Expt 7 – Tues Mar 30th, 2021 & Thurs Apr 1st, 2021

Expt 10 – Tues May 11th, 2021 & Thurs May 13th, 2021

S21 TENTATIVE SCHEDULE

Week	Day	Date	Lecture Topics	Lab This Week
1	M	1/18/21	Martin Luther King Holiday	
	T	1/19/21	PD Flex Day (no classes)	
	W	1/20/21		
	Th	1/21/21	Ch 12 - chemistry of alcohols	Welcome to S21 CHEM 12B lab (intro, expectations)
	F	1/22/21		
	Sa	1/23/21		
	Su	1/24/21	Last day to register w/o instructor's add code	
2	M	1/25/21		
	T	1/26/21	Ch 12 - chemistry of alcohols	Expt 1 - Unknown alkene -
	W	1/27/21		
	Th	1/28/21	Ch 12 - chemistry of alcohols	Expt 1 - Unknown alkene -
	F	1/29/21		
	Sa	1/30/21		
	Su	1/31/21	Last day to drop and be eligible for a refund	
3	M	2/1/21		
	T	2/2/21	Ch 13 - chemistry of ethers	Expt 2 - Reaction of Sodium Saccharin with EtI
	W	2/3/21		
	Th	2/4/21	Ch 13 - chemistry of ethers	Expt 3 - radical bromination reaction
	F	2/5/21		
	Sa	2/6/21		
	Su	2/7/21	Last day to add w/instructor's add code; Last day to drop without a "W"	
4	M	2/8/21	First Census Day	
	M	2/8/21		
	T	2/9/21	Radical Reactions (Ch 10)	Expt 3 - radical bromination reaction
	W	2/10/21		
	Th	2/11/21	PDA Day (no classes)	
	F	2/12/21	Lincoln's Day Holiday	
	Sa	2/13/21		
5	M	2/15/21	Washington's Day Holiday	
	T	2/16/21	Radical Reactions (Ch 10)	Expt 4 - Suzuki Coupling (in-person)
	W	2/17/21		
	Th	2/18/21	Ch 23 - Organometallics	Expt 4 - Suzuki Coupling (in-person)
	F	2/19/21		
	Sa	2/20/21	(Classes DO meet)	
	Su	2/21/21		
6	M	2/22/21		
	T	2/23/21	Ch 23 - Organometallics	Expt 4 - Suzuki Coupling
	W	2/24/21		
	Th	2/25/21	Aldehydes and Ketones (Ch 19)	Exam #1
	F	2/26/21		
	Sa	2/27/21		
	Su	2/28/21	Last day to opt for P/NP	
7	M	3/1/21		
	T	3/2/21	Aldehydes and Ketones (Ch 19)	Expt 5 - NaBH ₄ reduction
	W	3/3/21		
	Th	3/4/21	Aldehydes and Ketones (Ch 19)	Expt 5 - NaBH ₄ reduction
	F	3/5/21		
	Sa	3/6/21		
	Su	3/7/21		
8	M	3/8/21		
	T	3/9/21	Aldehydes and Ketones (Ch 19)	Expt 6 - Grignard Reaction
	W	3/10/21		
	Th	3/11/21	Carboxylic Acids and derivatives (Ch 20)	Expt 6 - Grignard Reaction (in person)
	F	3/12/21		
	Sa	3/13/21		
	Su	3/14/21		
9	M	3/15/21	Midterm progress indicators posted in student portal	
	M	3/15/21		
	T	3/16/21	Carboxylic Acids and derivatives (Ch 20)	Expt 6 - Grignard Reaction (in person)
	W	3/17/21		
	Th	3/18/21	Carboxylic Acids and derivatives (Ch 20)	Pet Molecule Project
	F	3/19/21		
	Sa	3/20/21		
3/22 to 3/28			No Classes-SPRING BREAK	
10	M	3/29/21		
	T	3/30/21	Carboxylic Acids and derivatives (Ch 20)	Expt 7 - Hydrolysis of a nitrile (Expt 31) - in-person
	W	3/31/21		
	Th	4/1/21	Chemistry of enols and enolates (Ch 21)	Expt 7 - Hydrolysis of a nitrile (Expt 31) - in-person
	F	4/2/21		
	Sa	4/3/21		
	Su	4/4/21		
11	M	4/5/21		
	T	4/6/21	Chemistry of enols and enolates (Ch 21)	Exam #2
	W	4/7/21		
	Th	4/8/21	Chemistry of enols and enolates (Ch 21)	Expt 8 - Rxn of esters with KOH
	F	4/9/21		
	Sa	4/10/21		
	Su	4/11/21		

Week	Day	Date	Lecture Topics	Lab This Week
12	M	4/12/21		
	T	4/13/21	Chemistry of enols and enolates (Ch 21)	Expt 8 - Rxn of esters with KOH
	W	4/14/21		
	Th	4/15/21	Conjugated Pi systems and pericyclic reactions (Ch 16)	Molecular Project
	F	4/16/21		
	Sa	4/17/21		
13	M	4/19/21		
	T	4/20/21	Conjugated Pi systems and pericyclic reactions (Ch 16)	Lab Practical (procedure for ester synthesis)
	W	4/21/21		
	Th	4/22/21	Aromatic compounds (Ch 17)	Lab Practical (procedure for ester synthesis)
	F	4/23/21		
	Sa	4/24/21		
14	Su	4/25/21	Last day to drop with a "W"	
	M	4/26/21		
	T	4/27/21	Aromatic compounds (Ch 17)	Lab Practical (procedure for ester synthesis)
	W	4/28/21		
	Th	4/29/21	Aromatic substitution reactions (Ch 18)	Pet Molecule Project
	F	4/30/21		
15	Sa	5/1/21		
	M	5/3/21		
	T	5/4/21	Aromatic substitution reactions (Ch 18)	Expt 9 - some chemistry of α -pinene oxide
	W	5/5/21		
	Th	5/6/21	Aromatic substitution reactions (Ch 18)	Exam #3
	F	5/7/21		
16	Sa	5/8/21		
	M	5/10/21		
	T	5/11/21	Aromatic substitution reactions (Ch 18)	Expt 10 - Friedel -Crafts
	W	5/12/21		
	Th	5/13/21	Amines (Ch 22)	Expt 10 - Friedel -Crafts
	F	5/14/21		
17	Sa	5/15/21		
	M	5/17/21		
	T	5/18/21	Carbohydrates (Ch 24)	Presentation - Molecular Project
	W	5/19/21		
	Th	5/20/21	Amino Acids (Ch 25)	Final Exam Review
	F	5/21/21		
18	Sa	5/22/21	**Final is administered the last Saturday Class**	
	M	5/24/21		
	T	5/25/21		
	W	5/26/21		
	Th	5/27/21	FINAL EXAM (7:00 am ~ 9:45 am)	
	F	5/28/21		
	Sat	5/29/21	Commencement Exercises	
	Fr	6/4/21	Final Grade Rosters Due	
	Sa	6/7/21	Spring semester processing finalized	