



Organic Chemistry II Lab - CH 246 A and B

School of Engineering and Science
Spring 2023

Meeting Times: Monday and Thursday 02:00 PM to 05:50 PM
Classroom Location: McLean Building Room 212
Instructor: Dr. Anju Sharma
Contact Info: McLean Room 313, asharma@stevens.edu, 201-216-5530
Office Hours: Dr. Sharma, R 11:00 AM to 12:00 PM. (Hybrid)
Zoom Link: <https://stevens.zoom.us/j/99307833624>
TA:
Course Web Address: <https://sit.instructure.com/courses/64472>
Prerequisite(s): CH 245 Organic Chemistry I Lab
Corequisite(s): CH 244 Organic Chemistry II
Cross-listed with: None

COURSE DESCRIPTION

Laboratory work to accompany CH 244: Laboratory includes introduction to organic reaction and separation techniques, reaction of functional groups, and synthesis.

LEARNING OBJECTIVES

After successful completion of this course, students will be able to...

- Carry out organic synthesis reaction.
- Use air- and moisture sensitive reagents with special handling procedures.
- Correlate spectral characteristics such as IR, ^1H NMR and ^{13}C NMR spectra of organic compounds with structure.
- Identify unknown compounds using experiments or spectral data.
- Use thin layer chromatography for analysis of compounds.
- Use structure drawing tools such as ChemDraw.
- Design an experimental procedure for a given reaction.
- Design an isolation and purification procedure.

FORMAT AND STRUCTURE

This course consists of nine laboratory experiments.

COURSE MATERIALS

Recommended Textbook(s): Wilcox and Wilcox, Experimental Organic Chemistry: A Small Scale Approach (2nd edition), Prentice Hall (1994).

Other Readings: Available online through Canvas course shell and/or handouts provided in the class

Required Materials: Safety goggles, calculator.

COURSE REQUIREMENTS

Attendance:

Attendance will be taken at the start of the lab (Check-in sheet). A student will lose 50 points (0 points for prelab, quiz, lab performance and lab report each) for each **unexcused absence**. The grades for excused absences (athletic, religious or medical, noted in an email to the professor prior to the absence occurring) accompanied by proper documentation will be determined by the average of the other lab performance and lab reports. At least 7 lab experiments must be successfully completed*. (* If more than 2 excused absences occur during the semester, it is the student's responsibility to follow up with the instructor with time slots so a make up can be scheduled. If a time cannot be determined during the semester, a make up will be scheduled at the end of the semester.)

Prelab Write-up:

A pre-laboratory protocol for each experiment must be completed and submitted before the laboratory session (use Pre-Lab Report template for write-up). A paper copy must be brought to the lab; all observations and results must be recorded on this sheet (in ink). This will be checked by the instructor before student enters or begins the experiment. It must include information such as date, title, purpose, balanced equation, reagents table, calculation, safety information and bullet point summary of the lab procedure in your own words including diagram of any special apparatus to be used in the lab.

The purpose of the pre-lab report is to review beforehand:

- Physical properties of all chemicals used as they apply to the successful conduct of the experiment.
- Role of various chemicals in the reaction (reactant, reagent, catalyst, solvent, etc.)
- Hazards to enable safe handling of all chemicals involved.
- Safe disposal into the appropriate waste containers.

You may not perform the lab, if a pre-lab report has not been completed. If the pre-lab is not uploaded but a printed copy of the completed pre-lab is brought to lab, you will be allowed to conduct the experiment, but would not receive credit in canvas.

Quizzes:

There will be scheduled quizzes linked to each experiment. Quiz questions will be drawn from general theory related to the reaction, techniques, safety, waste disposal, etc. All quizzes will be graded for accuracy. All excused absences will see an "Excused" in the grade book. Unexcused absences will receive a grade of 0 for that quiz. Quizzes are in-class assignments and **must be completed during class** (lab) periods.

Lab Performance:

Lab performance points are AWARDED for: demonstrating familiarity with the experimental procedure, demonstrating proper experimental technique, following safety protocols and housekeeping rules, keeping your personal lab bench and communal areas clean, properly (and carefully) disposing of waste, interacting appropriately with fellow students and the teaching assistants.

Post-Lab Report:

The post-lab reports must be completed using a template that will be provided in the class. Lab reports are normally due one week after conducting the lab unless directed otherwise.

The template clearly identifies the number of points assigned to each section for grading, please follow the directions and the template closely to avoid losing points.

After the due date the lab reports will be accepted for grading with a late submission penalty as follows:

- Submitted late within the first 24 hours; 5% penalty*.

- After 24 hours and within 48 hours; 10% penalty.

Only two late submissions will be permitted. Additional late submissions will not be accepted for grading and 0 points will be assigned.

Two attempts are allowed, you will have the option to re-submit if you notice errors. The last attempt must be submitted in a timely manner before the due date (to avoid penalty). Emailed submissions and submissions posted to the comments section will not be accepted. Failure to submit lab report (unless excused) will result in 0 points for the report.

Note: Free Chemdraw software is available to download at Stevens software site. All structures, reactions and mechanisms should be drawn using a structure drawing app only. Handwritten structures are not acceptable.

Exams:

There will be two exams in this course, a midterm exam and a final exam.

Both exams will consist of a written section (theory) and a hands-on section (lab). The written section is closed book, all necessary constants and a periodic table, as needed will be provided. Both sections must be completed during your assigned lab period only.

The mid-term exam quiz questions will be cumulative until the week prior to the date of the mid-term.

The final exam quiz will be cumulative.

Midterm and final exam dates are listed in the tentative course schedule below. If you are aware of a conflict, you must contact Dr. Sharma via email as soon as possible and explain the nature of the conflict along with documentation, as appropriate.

Make-up Policy There is no make-up of the lab, except under exceptional circumstances. For students missing more than 2 labs with excused absences, make up labs will be scheduled. Excused absences will see an "Excused" for all assignments in the grade book; but you are responsible for reviewing the theory and assigned reading for the experiments (for the Final Exam). It is the student's responsibility to follow up with the instructor with time slots so a make-up can be scheduled. If a time cannot be determined during the semester, a make-up will be scheduled at the end of the semester.

If you miss the mid-term or final exam due to a **documented** excused absence, you must make it up. Make-ups will be likely offered at the end of the semester or during the Final Exam period, please communicate with the course instructor.

GRADING PROCEDURES

Grades will be based on:

Prelab Write-up	(10%)
Quizzes	(10%)
Lab Performance	(10%)
Lab Report	(20%)
Midterm	(25%)
Final	(25%)

ACADEMIC INTEGRITY

Undergraduate Honor System

Enrollment into the undergraduate class of Stevens Institute of Technology signifies a student's commitment to the Honor System. Accordingly, the provisions of the Stevens Honor System apply to all undergraduate students in coursework and Honor Board proceedings. It is the responsibility of each student to become acquainted with and to uphold the ideals set forth in the [Honor System Constitution](#). More information about the Honor System including the constitution, bylaws, investigative procedures, and the penalty matrix can be found online at <http://web.stevens.edu/honor/>

The following pledge shall be written in full and signed by every student on all submitted work (including, but not limited to, homework, projects, lab reports, code, quizzes and exams) that is assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed. *“I pledge my honor that I have abided by the Stevens Honor System.”*

Reporting Honor System Violations

Students who believe a violation of the Honor System has been committed should report it within ten business days of the suspected violation. Students have the option to remain anonymous and can report violations online at www.stevens.edu/honor.

EXAM ROOM CONDITIONS

The following procedures apply to quizzes and exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Room Conditions on the quiz or exam.

- Students may use the following devices during quizzes and/or exams if permitted by the instructor. Any electronic devices that are not mentioned in the list below are not permitted.

Device	Permitted?	
	Yes	No
Laptops	X	
Cell Phones		X
Tablets (in lieu of laptop only)	X	
Smart Watches		X
Google Glass		X
Other (Nonprogrammable calculator)	X	

- Students are not allowed to use the following materials during quizzes **and/or** exams. Any materials that are not mentioned in the list below are also not permitted.

Material	Permitted ?	
	Yes	No
Handwritten Notes		X
Typed Notes		X
Textbooks		X
Readings		X

- Students are/are not allowed to work with or talk to other students during quizzes and/or exams.

LEARNING ACCOMMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis. For more information about Disability Services and the process to receive accommodations, visit <https://www.stevens.edu/office-disability-services>.

If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone 201-216-3748.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). Appointments can be made by phone (201-216-5177).

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.

Any changes to this syllabus will be announced in class and posted on Canvas

GENERAL SAFETY RULES

Safety is paramount. Always wear goggles and gloves. Wear other personal protective equipment as necessary. Wear suitable clothes (full length trousers – no shorts, skirts, open-toed shoes or sandals are

permitted) in the lab. Sturdy cottons are best; denim jeans and cotton shirts. Shoes should be secure fitting, not ones that can slide off your feet easily. Secure your loose long hair before you enter the lab. No eating and drinking in the lab.

Dispose of waste, gloves and broken glass into their respective containers in the proper manner. Leave all areas (bench tops, hoods etc.) in good order. Pay extra attention to safety precautions. Anyone in safety violation will not be permitted to the lab.

All students are required to refer to the MSDS for all chemicals (reagents, solvents, products etc.) used in the lab (see www.fishersci.com and /or www.aldrich.com). These will also be posted to each experiment's module, please read through before each lab.

TENTATIVE COURSE SCHEDULE (CH 246 Lab A, Monday)

The following is a tentative course schedule. Any and all changes to this schedule will be communicated to you 1) in class and 2) via email. The Canvas shell for this course will always be kept up-to-date so you can always reference the "Assignments" tab for accurate due dates.

Zoom link for Lab Experiment Discussion: <https://stevens.zoom.us/j/93068192772>

Date	Experiments	Lab Title	Procedure	Readings
January 23	Check-in, Safety, Spectroscopy			
January 30	Exp 1	Esterification: Preparation of methyl benzoate	p 379 (C)	Wilcox pp 375-381; Klein: Sections 12.9 and 20.10
February 6	Exp 2	Grignard Reaction 1	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 13	Exp 2 continues	Grignard Reaction 2	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 22*	Exp 3	Alcohol Oxidation	Handout	Wilcox pp 353-358; Klein: Section 12.10
February 27	Exp 4	Diels-Alder reaction	Handout	Wilcox pp 428-434; Klein: Section 16.7
March 6	Exp 5	Carbonyl reactions	Handout	Wilcox pp 359-361; Klein: Section 19.6
March 13	<i>No-class</i> (Spring Break)			
March 20	Exp 6	Ketone Reduction	p 363	Wilcox pp 362-365; Klein: Section 19.9
March 27	Mid-term Exam			Expt 1-6
April 3	Exp 7	Wittig Reaction	p 369 (A)	Wilcox pp 366-370; Klein: Section 19.10
April 10	Exp 8	Saponification	Handout	Wilcox pp 375-381; Klein: Section 20.11

April 17	Exp 9	Amide Synthesis	Handout	Wilcox pp 199-201; Klein: Section 20.12
April 24	Exp 10	Aldol Reaction	p 399 (A)	Wilcox pp 397-400; Klein: Section 21.3
May 1	Final Exam			Exp 1 – Exp 10

* February 20, 2023 (*President's Day, No Classes*); February 22, 2023 (Monday Class Schedule);
March 12-19, 2023 (*Spring break, No Classes*)

TENTATIVE COURSE SCHEDULE (CH 246 Lab B, Thursday)

The following is a tentative course schedule. Any and all changes to this schedule will be communicated to you 1) in class and 2) via email. The Canvas shell for this course will always be kept up-to-date so you can always reference the "Assignments" tab for accurate due dates.

Zoom link for Lab Experiment Discussion: <https://stevens.zoom.us/j/92533902897>

Date	Experiments	Lab Title	Procedure	Readings
January 19	Check-in, Safety, Spectroscopy			
January 26	Exp 1	Esterification: Preparation of methyl benzoate	p 379 (C)	Wilcox pp 375-381; Klein: Sections 12.9 and 20.10
February 2	Exp 2	Grignard Reaction 1	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 9	Exp 2 continues	Grignard Reaction 2	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 16	Exp 3	Alcohol Oxidation	Handout	Wilcox pp 353-358; Klein: Section 12.10
February 23	Exp 4	Diels-Alder reaction	Handout	Wilcox pp 428-434; Klein: Section 16.7
March 2	Exp 5	Carbonyl reactions	Handout	Wilcox pp 359-361; Klein: Section 19.6
March 9	Exp 6	Ketone Reduction	p 363	Wilcox pp 362-365; Klein: Section 19.9
March 16	<i>No-class (spring break)</i>			
March 23	Mid-term Exam			Expt 1-6
March 30	Exp 7	Wittig Reaction	p 369 (A)	Wilcox pp 366-370; Klein: Section 19.10
April 6	Exp 8	Saponification	Handout	Wilcox pp 375-381; Klein: Section 20.11

April 13	Exp 9	Amide Synthesis	Handout	Wilcox pp 199-201; Klein: Section 20.12
April 20	Exp 10	Aldol Reaction	p 399 (A)	Wilcox pp 397-400; Klein: Section 21.3
April 27	Final Exam			Exp 1 – Exp 10

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 March 12-19, 2023 (*Spring break, No Classes*)



Organic Chemistry II Lab - CH 246 A

School of Engineering and Science

Spring 2023

Classroom Location: Organic Chemistry Teaching Laboratory, McLean Building Room 212

TENTATIVE COURSE SCHEDULE (CH 246 Lab A, Monday)

The following is a tentative course schedule. Any and all changes to this schedule will be communicated to you 1) in class and 2) via email. The Canvas shell for this course will always be kept up-to-date so you can always reference the “Assignments” tab for accurate due dates.

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January 30	Exp 1	Esterification: Preparation of methyl benzoate	p 379 (C)	Wilcox pp 375-381; Klein: Sections 12.9 and 20.10
February 6	Exp 2	Grignard Reaction 1	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 13	Exp 2 continues	Grignard Reaction 2	Handout	Wilcox pp 406-411; Klein: Section 12.6
February 22*	Exp 3	Alcohol Oxidation	Handout	Wilcox pp 353-358; Klein: Section 12.10
February 27	Exp 4	Diels-Alder reaction	Handout	Wilcox pp 428-434; Klein: Section 16.7
March 6	Exp 5	Carbonyl reactions	Handout	Wilcox pp 359-361; Klein: Section 19.6
March 13	<i>No-class (Spring Break)</i>			
March 20	Exp 6	Ketone Reduction	p 363	Wilcox pp 362-365; Klein: Section 19.9
March 27	Mid-term Exam			Expt 1-6
April 3	Exp 7	Wittig Reaction	p 369 (A)	Wilcox pp 366-370; Klein: Section 19.10

April 10	Exp 8	Saponification	Handout	Wilcox pp 375-381; Klein: Section 20.11
April 17	Exp 9	Amide Synthesis	Handout	Wilcox pp 199-201; Klein: Section 20.12
April 24	Exp 10	Aldol Reaction	p 399 (A)	Wilcox pp 397-400; Klein: Section 21.3
May 1	Final Exam	Cumulative		Exp 1 – Exp 10

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March 12-19, 2023 (*Spring break, No Classes*)