

## ORGANIC CHEMISTRY LABORATORY

### Chemistry 211 Fall 2021

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**YOU MUST FOLLOW ALL COVID SAFETY GUIDELINES TO ENSURE YOUR OWN HEALTH AS WELL AS OTHERS. MASK IS MANDATORY FOR THIS COURSE. YOU HAVE TO WEAR A MASK ALL THE TIME, YOU ARE IN THE LAB.**

#### **PREREQUISITE**

Chemistry 171 (or equivalent General Chemistry Laboratory Course). Students who have not satisfied this prerequisite will not receive credit for this course even if they are enrolled.

#### **COURSE OBJECTIVES**

This course is designed to introduce the theory and practice of analytical and purification techniques commonly used in Organic Chemistry. These techniques will be used in the synthesis experiments carried out in the latter part of the course. The goal of the course is for students to be able to analyze data obtained from their observations in the experiments they perform, form reasonable conclusions and relate the reactions and reaction mechanisms from Organic Chemistry to support their analysis and conclusions.

#### **REQUIRED COURSE MATERIALS**

1. **Text Package:** Signature Lab Series: Elementary Organic Chemistry Laboratory Chemistry 211. The textbook is an e-text book and you can find the link to buy the book on Canvas.

2. **Technology requirements:** You need a laptop or PC to take the online quiz and upload the pre lab and post labs to Canvas. You do not need to bring your computer with you. [In case we are switching to online lab, you will **need a laptop or a desktop with camera/microphone** to watch online lab. Highspeed internet is also required. **Labs will be in-person. Your TA will discuss in details about the Lab structure in the first meeting. Each lab may be conducted in different way and you will be notified by announcement through Canvas ahead of time.** Important directions about the lab will be given by your TA during each week in the lab.

3. **Laboratory Notebook:** You do not need a notebook but if you want to get any notes get a regular notebook or use your laptop or PC to take notes.

4. **Mask and Safety goggles: You must wear a mask before you enter the lab. If you came without a mask, you would not get permission to do the lab until you manage to get a mask. No mask will provide to you in the lab.**

To protect your eyes in the laboratory (must be face-fitting and form seal around eyes; ordinary glasses or other types of safety glasses are not acceptable). You will not be allowed in the lab **without a Mask or safety goggles.**

5. **“Disposable Chem Kit”:** Available at stockroom.

6. **Substantial padlock:** To secure the contents of your assigned drawer.

7. **A nongraphing simple calculator:** for use on quizzes

## COURSE POLICIES

1. **Promptness:** Laboratory session will begin, and end promptly as scheduled. You must join the meeting every week as scheduled. In the first week of lab which is Sept 13<sup>th</sup> (for Monday sections) and Sept 14<sup>th</sup> (Wednesday sections) your TA will explain how the LAB will go for the rest of the semester.

2. **Make-up:** The labs this semester is extremely full. A missed lab period may be made up only for valid medical reason (with a doctor's note as documentation), a religious holiday (with valid documentation from the student's religious leader), valid school activities (with valid documentation) and/or with a note from the dean's office. The student is responsible for contacting Dr. Pramanik. The lab must be made up before the last date of the experiment listed under "Experiment Schedule". **Under no circumstances will a make-up lab be permitted once the last date for that experiment has passed.**

You should still contact Dr. Pramanik immediately if you cannot find a time for a make up lab because last minute absences in some sections may clear a spot for you to make up your lab. If you manage to make up your lab, **the lab report must be marked clearly with student's name, lab instructor's name and section number and turned in, on time and online.** You may be also presented with alternate options to complete a lab report so make sure you contact Dr. Pramanik immediately if you have to miss a lab for a valid reason.

**If you fail to attend the make up lab session that was agreed upon by you and Dr.**

**Pramanik**, the absence would be considered unexcused UNLESS Dr. Pramanik was informed of a timely manner that a valid reason (with documentation) caused you to miss your make up lab. Missing a make up lab without a valid documentable reason that Dr. Pramanik was not informed about beforehand may also carry additional penalties.

**Absences:** For an absence to be excused, Dr. Pramanik must be contacted immediately in case there is a chance for the lab to be made up. Valid documentation **MUST** be provided **within a week of the absence** to your lab instructor **and** Dr. Pramanik. Additionally, you must use the University absence reporting website <https://sims.rutgers.edu/ssra/> <<https://sims.rutgers.edu/ssra/>> also within a week of the absence to indicate the date and reason for your absence. If the above steps are not followed, the absence will not be excused. **NOTE: A student with 3 or more absences (valid or otherwise) will not pass the course.**

**Vacation plans are NOT valid reasons for lab make-up or absences.**

**Religious holidays and valid school activities:** Students have to contact Dr. Pramanik about potential absences due to religious holidays and valid school activities (sports meet etc) **by 9/13/21** so that make-ups can be arranged. Students are then responsible for e-mailing Dr. Pramanik with their detailed schedule for the week of the potential absence **two weeks from the potential absence** to receive instructions on a makeup or alternate arrangements. Valid documentation **MUST** be provided for these potential absences by 9/13/21. Students are responsible for all the material from a missed lab and will be tested on it in quizzes.

3. **Quizzes** A short quiz (10 mins) will be POSTED ON CANVAS every week including Check-Out week. The quiz will be online and it will be open for 21 hrs (12 noon to 9am, next day). You can take the quiz at your convenience during 21 hrs open period. As for example, for Monday sections, the quiz will be open at 12 noon, Monday and it will be closed at Tuesday 9 am. For Wednesday sections it will open at 12 noon, Wednesday and close at 9 am Thursday. The material for the quizzes will be the previous week's lab and the lab you are about to do that week. A safety quiz will be given during the first week.
4. **Preparation** Adequate preparation before lab will reduce frustration and better understanding about the experiment. So please read the procedure and all the notes provided to you before the lab meeting.
5. **Website:** We will be using canvas (URL: <https://canvas.rutgers.edu/>) a classroom management system. You should check this site regularly. If you check it now, you will find several documents posted. If you are registered in the course and a Rutgers Student, you will automatically be a "member" of the online class. **Under Module , which you should go to every week to prepare for your lab, you will see modifications for experiments that you will conduct, instructions on how to write up your inlab (lab notebook entries), and preparations for this experiment. It is extremely vital that you check the website weekly for information on the experiments you are about to conduct.**
6. **Laboratory Safety** All persons in the lab must observe the safety rules when in the lab. Since this year all the labs are online you do not need to follow the rules but must know the rules for safety quiz.
7. **Exams that Conflict with Lab:** Your laboratory period is a scheduled class. If you have a group exam that conflicts with your lab, your lab takes priority. You will have to plan with the professor of the class with the group exam to take a conflict exam. Make-ups for lab will not be approved for this situation.
8. **Students with Disabilities:** If you have a disability, you are urged to speak to the course coordinator by 9/20/21 and make the necessary arrangements to support a successful learning experience. Also, you must arrange for the course coordinator to receive a letter from your College's Disability Concerns Coordinator verifying that you have a disability. The student must contact the Office of Disability Services to determine his/her Coordinator (848)-445-6800.
9. **Academic honesty** You are being graded on the work you perform. Use of lab reports from other students (past or present) is expressly forbidden. **Both the lender and the borrower are subject to severe penalties.** Some discussion about the labs is acceptable at the discretion of the lab instructor, but you must perform all the work (including the data analysis and answering of questions) yourself. **A lab report is NOT a collaborative effort** –it must be written in your own words using your own data. The lab instructor is free to ask you at any point to explain what you are doing. This is to help the lab instructor instruct the confused and prevent copying of answers. If you are confused, ask for help. Don't just copy an answer. **Do not make up data.** Academic honesty also applies to all quizzes and exams in this course.

***Unauthorized posting and sharing of course material (including but not limited to: syllabi, lecture notes, past, present and future quizzes and exams, prelab and postlab questions) in paper form or online during the current semester and/or in the future is STRICTLY PROHIBITED. The unauthorized posting and sharing of course material is a violation of copyright law AND a violation of academic integrity and appropriate***

*action will be taken against person(s) who violate this law. Report any violations promptly.*

10. **Chain of Command:** If you have a question about grading, you should first talk about it with your lab instructor. If you are not satisfied with the explanation, you may raise the question with the course coordinator. We will not intervene for questions of a small number of points. If you have a question about content, concepts, or procedures then you may ask any lab instructors or the coordinator for help. Use our office hours.

### **NOTES!!!**

1. The theoretical and practical parts for each experiment will be discussed in the lab every week by your TA.
3. Read the material and be prepared before lab.
4. The pre-lab questions of your report must be submitted in the Canvas before each lab (the date and time for each pre lab can be found in the Canvas for each section). **If you do not turn in your prelab questions in during the due date mentioned in the canvas site, points may be deducted, or you may not receive any points on the prelab part of the experiment.** The post-lab of your report will be due on certain date and time on canvas site. **Any delay in turning in the postlabs (except for excused absences) will result in significant deductions of points or no points being awarded for that postlab.**

**All reports must be submitted online using .doc/pdf file or if you prefer to handwrite then upload a scanned copy or picture on canvas.**

### **GRADING**

1.	Laboratory Reports (32 points* x 9 experiments)	288 points
2.	Safety Quiz	5 points
3.	Quizzes (16 points x 8)	128 points
4.	Super Quizzes (administered during Week 7 and 10)	54 points
	<b>TOTAL(MAX)</b>	<b>475 points</b>

\*points may change and therefore total points will change accordingly. Your overall grade will be evaluated based on the total points you have got over MAX total.

## LABORATORY SAFETY RULES

There are a few precautions that you must take to avoid accidents in the lab.

1. Face-fitting goggles must always be worn in the laboratory. Contact lenses, even with goggles are not permitted. Students that have a medical need to wear contact lenses while working in the teaching laboratory (proper visual acuity to complete assigned tasks) will need to inform the course coordinator and their lab instructor **and** be evaluated by Student Health. Upon review by Student Health, the student must continue to wear appropriate splash goggles at all times while in the teaching lab environment, and must also notify Student Health if they experience irritation or other problems while working in the lab environment so that REHS can do an assessment. **Students not in compliance will be dismissed from the lab.**
2. Know the location of laboratory exits. Know the location and use of fire extinguishers, eye-wash fountains, safety showers, and fire blankets in the laboratory.
3. For safety reason, you must inform your lab instructor if you leave the laboratory while an experiment is being carried out. If you feel unwell or if you see lab mate unwell while carrying out an experiment, it is crucial that you inform your lab instructor. Playtex-type rubber gloves are always to be worn when handling chemicals.
4. Appropriate attire for performing experiments is a must and non-negotiable. Pants or skirts worn **MUST** cover the entire length of your legs (there should not be any rips or tears that expose any part of legs). Shoes **MUST** be close-toed and close backed **AND** enclose your entire foot. Tops must be at least short-sleeved. Open shoes/sandals, shorts, frilly or cumbersome clothing, bare backs or midriffs (or clothing that exposes backs and midriffs when a student reaches up or bends over), sleeveless tops, neckties, and unconfined long hair present considerable hazard in the laboratory and are **NOT PERMITTED**. Long hair should be tied back
5. All experimental work is to be done in the hoods. Apparatus may be cleaned at regular benches.
6. If the fire alarms go off, stop all experimental work and leave all chemicals and equipment in the lab. Follow instructions of lab instructor and head for an exit and assemble outside the building to the area you were instructed to go to by the lab instructor as quickly as possible.
7. Avoid breathing the vapors of volatile solvents. Some organic solvents may be toxic or carcinogenic (cancer-producing). Organic solvents should be used in the hood.
8. Avoid contact of chemical with your skin, eyes, and clothing.
9. Handle strong acids and bases with extreme care. Strong acids and bases must remain in the allotted hoods.
10. Dispose organic waste in labeled waste containers. No waste solvents or reaction mixtures should be poured into the sinks!
11. Glass waste and broken glass **MUST** be disposed of in the broken glass containers. They **MUST NOT** be thrown in the regular trash due to potential harm to those who handle the trash.

## LABORATORY SAFETY RULES (continued)

12. No smoking, eating or drinking is allowed in the laboratory.
13. Pipetting by mouth is prohibited.
14. No unauthorized experiments or other horseplay is allowed.
15. Students must be familiar with a procedure before attempting it.
16. Clean your work area, and clean dirty glassware at the end of each period.
17. Accidents must be reported at once to lab instructor and coordinator of the course
18. All spills must be cleaned up immediately by person responsible.
19. All students are responsible for knowing the safety rules and observing them. Violation may result in expulsion from laboratory.

**REPORT EMERGENCIES TO THE RUTGERS UNIVERSITY POLICE AT  
6-911**

### **Submission of product for grading**

***NOTE! ENHANCEMENT OF PRODUCT YIELD WITH OTHER MATERIALS IS  
CHEATING.***

Use the disposable test tubes and corks supplied in your accessories kit. Make sure your sample is completely dry and free of large lumps. Label each test tube with the following information:

Name of compound  
Structural formula of compound  
Yield; weight and percent  
Melting or boiling range  
Name of student  
Section number and name of lab instructor

Secure all test tubes with a rubber band or tape if more than one test tube is submitted.

### **BASIC LABORATORY OPERATIONS**

#### **Laboratory Glassware**

Since your glassware is expensive and since you are responsible for it, you will want to give proper care and respect. Needless maltreatment of your equipment may cost you money; so if you read this section carefully and follow the procedures, you may be able to avoid some unnecessary expense. Mistreating equipment can also cause lost time in the laboratory. Cleaning problems and replacing destroyed glassware are time-consuming.

#### **Cleaning Glassware**

Glassware can be cleaned more easily if it is cleaned immediately after use. With time the organic residues left in the flask will harden and stick on the surface of the flask. To remove gummy material from glassware, scrape as much as you can directly in the labeled waste container; never put organic tars, paper and other solid wastes into the sink. Next, try to remove the remaining residue by using a small amount of acetone (1-2mL). The remaining small amounts of tars and dirt can then be removed with a large test tube brush bent in such a way that it will reach the inner surfaces of the flask. The use of a little washing powder or liquid detergent followed by a good water rinse will give a clean glassware when it dries.

***Caution!! Safety goggles must be worn when you are cleaning your glassware.***