# CHEM 2125-11  Organic Chemistry II Laboratory Spring 2018

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**Office hours:** Monday 2:00 – 4:00 pm and Tuesday 10:00 am – 12:00 pm, or by appointment

**Meeting times/Locations:** Thursday 9:25 am –12:05 pm @ESCNE 3.160  
**Text:** Organic Chemistry II Laboratory Manual (Available at [UTRGV bookstore](#))

## Course Schedule

<table>
<thead>
<tr>
<th>Exp. #</th>
<th>Date</th>
<th>Experiment title</th>
<th>Pre-lab Quiz (9:25 am)</th>
<th>weighing m.p.</th>
<th>Post-lab Report (9:25 am)</th>
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</thead>
<tbody>
<tr>
<td>Jan 18</td>
<td>Martin Luther Kings Day week (no lab)</td>
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<tr>
<td>Jan 25</td>
<td>Check-In, Course Description, Safety</td>
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<tr>
<td>1</td>
<td>Feb 1</td>
<td>Friedel–Crafts Acylation</td>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
<td>Feb 8</td>
<td>Nucleophilic Aromatic Substitution</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Feb 15</td>
<td>Synthesis of Acetaminophen</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Feb 22</td>
<td>Dyes and Dying and <strong>Mid-Term Review</strong></td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Mar 1</td>
<td><strong>Mid-Term Exam</strong> (Exp 1–4)</td>
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<tr>
<td>5</td>
<td>Mar 8</td>
<td>Fisher Esterification</td>
<td>5</td>
<td></td>
<td>4</td>
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<tr>
<td>Mar 15</td>
<td><strong>Spring Break No Lab</strong></td>
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<tr>
<td>6</td>
<td>Mar 22</td>
<td>Diels Alder Reaction</td>
<td>6</td>
<td></td>
<td>5</td>
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<tr>
<td>Mar 29</td>
<td><strong>Easter Break No Lab</strong></td>
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<tr>
<td>7</td>
<td>Apr 5</td>
<td>Nucleophilic Addition to Carbonyl Group</td>
<td>7</td>
<td>6</td>
<td></td>
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<tr>
<td>8</td>
<td>Apr 12</td>
<td>Infrared and Nuclear Magnetic Resonance Spectroscopy</td>
<td>No pre-lab quiz</td>
<td>7</td>
<td>6</td>
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<tr>
<td>Apr 19</td>
<td>Final Review and Check-out</td>
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<tr>
<td>Apr 26</td>
<td><strong>Final Exam</strong> (Exp 5–8)</td>
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</tbody>
</table>

* The lab report for Exp 8 (IR and NMR) will be multiple choice quizzes. The due is not 9:25 am. This will be April 19 (Thu) @11:59pm.

**NOTICE:** Students will Not be allowed into lab if they are Not on time.

## Course Description and Prerequisites
- An introduction to organic synthesis. Fundamental techniques such as crystallization, distillation, extraction, and chromatography are discussed. These techniques are applied to the preparation and purification of organic compounds.
- Prerequisite: CHEM 2323 (minimum grade of D) or can be taken concurrently.

## Learning Objectives for Core Curriculum Requirements
This course is not part of the UTRGV core curriculum requirements.

## Course objective:
The Objectives of this course are that you:
- Become familiar with basic organic chemistry methods and techniques
- Learn how to comply with laboratory safety polices
Program/Major student learning outcomes

• Graduates will have both broad knowledge and skills of critical thinking in the chemical sciences
• Graduates are prepared to conduct or participate in advanced research
• Graduates will demonstrate the ability to communicate chemical knowledge
• Graduates are prepared to search for employment (including graduate or professional school)

Course Student Learning Outcomes

• To learn safety and handling of chemicals in the laboratory.
• To gain hands on experience in laboratory techniques.
• To gain experience in the characterization of organic compounds.
• To Maintain a proper laboratory notebook and write a scientific report.
• To learn the art of Organic Chemistry Synthesis.
• To demonstrate the use of Organic Chemistry in Medicine.

Blackboard: There is a Blackboard for this course. All materials will be accessible on it including Pre-lab quiz. The lab reports should be submitted through Blackboard, too. Occasionally, the instructor may provide additional information by announcements. These announcements will be communicated via e-mail. It is advised that students check their university issued email accounts daily (e-mail will only be sent to UTRGV accounts).

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Pre-lab quiz</td>
<td>10%</td>
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<tr>
<td>Post-lab reports</td>
<td>45%</td>
</tr>
<tr>
<td>Mid-term exam</td>
<td>20%</td>
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<tr>
<td>Final exam</td>
<td>20%</td>
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<tr>
<td>Laboratory Safety and Practice</td>
<td>5%</td>
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</tbody>
</table>

Grade assigned A≥90,  90>B≥80,  80>C≥70,  70>D≥60,  F<60

Pre-Lab Quizzes: (10%) – Multiple-choice pre-lab quiz will be administered online (Blackboard) for each lab. The quiz window will close on the time of the Lab (Thursday 9:25 am). If you missed or late submission = 0 points. You must submit your answers by 9:25 am. The quiz will have two attempts, 30 min each. Highest grade will be taken. The quizzes will NOT be re-opened for ANY reason. Give yourself time just in case something goes wrong with your connection or computer problems or the weather, etc. If you have any problems on the Blackboard access, immediately submit a Helpdesk ticket. You can drop one worst quiz.

Lab reports: (45%) – Your lab reports should be submitted through the Blackboard. Each lab report will be due the following week after the experiment is executed (or checking melting point) at the beginning of the lab. Please check the schedule carefully on the Table. Your lab report will be counted only if you attended the lab. Outline for the report's components is elaborated on below. Late work will be subject to automatic loss of points (with a deduction of 30%—you will get your grade x 0.7). You can drop one worst lab report.

Midterm and Final exams (20% each): You will need a picture I.D.

Laboratory Safety and Practice (5%)-examples: proper waste disposal, cleanup, and personal protective equipment: Safety glasses/goggles and lab coats must be worn in the lab at all times. You must follow all the safety rules and procedures in the lab. For each act against the rules, you will lose 1% from the 5%.

Important safety rules (Safety is 5% for your grade)

Students in violation of safety regulations will NOT be allowed in lab!

• Always know the danger of the chemicals you are working with. You should research the safety and chemical reactivity of all reagents before coming to class and ask your instructor if you have any further questions.
• ALL chemical activities are done in the hood. The bench is for maintaining your notebook and supplies for your activity.
• Always wear safety glasses/goggles. This is a State law. You do not have the choice to not comply.
Always wear lab coats
- Wear long Pants – No part of the legs should be exposed. (no skirts or shorts, No Leggings or Capris)
- Wear closed shoes (no rubber sippers or open sandals)
- Know where the eye wash, safety shower, and fire extinguisher are located
- Long hair must be tied back
- No hats
- No food/drink items are allowed in a chemistry laboratory
- Keep your work space clean!!!!!!
- If there is a chemical spill, inform the instructor immediately.
- If you are injured (a cut, inhalation of toxic gases, acid burn on skin, etc.) inform your instructor immediately.
  We are required to file reports of all injuries, no matter how minor, and also to offer you the option to seek medical aid.

Important waste information:
- None of the waste can go down the drain.
- Organic solvent waste, aqueous waste, solid waste, and glass waste is collected separately and placed into designated waste containers.

Guideline for Lab Report
Your lab report should be open style and not more than 5 pages (3 pages recommended). No cover page required. Include only meaningful information. Even you work as a team, your lab report should be individual without copying your partner’s report. The copied reports will receive a zero for both.

Lab Report: An easy passing grade can be obtained for lab report can be obtained by following format
1. Date (2pts): When you did the experiment. It is not when you uploaded your report.
2. Title (2pts)
3. Objectives (3 pts): The objective/purpose of the experiment was to…… one or two sentences.
4. Introduction (15 pts): Background. Your introduction should be in paragraph form and not more than 10 sentences.
   a. It should state the name and structures (3 pts)
   b. There should be only a brief description of what you are explained in the pre lab in order to obtain your product from your starting materials (i.e. procedure). In this section explain the important parts of your experiment including the mechanism of your reaction (12 pts)
5. Materials (5 pts)
   a. List your materials. It should include the name and molecular formula of the reagents used.
   b. Any solutions that were used should be specified (e. g. their concentrations)
6. Procedures (40 pts) In a paragraph, using past tense. (if a sentence was written in a present tense, 2 points will be taken for each). Write the procedures that you exactly followed. If applicable, insert tables, charts, and pictures with the appropriate titles and descriptions to each one.
   a. The procedure should be in list form. Make sure each step is stated as a complete sentence. Include observations (e.g. color change, precipitation, reaction is exothermic, gas evolution, etc.) Observation is the main thing to know you actually did the experiment. Take 5 points off for missing one important observation.
      Example 1) 2.05 mL of compound A was placed into a 50 mL round bottom flask.
      2) 1.01 g of compound B was quickly added, and the color of the solution changed from yellow to red immediately.
      3) The mixture was stirred at room temperature for 30 min.
   b. The procedure should be a detailed description of what you did in lab including the amount of reagent/time required for each step, the temperature, etc… with the correct units for each value.
   c. All set-ups must be described. If a picture of a set-up (glassware) is included in the report, it is not necessary to describe in detail the setup in your procedure. When you include pictures, do not forget to add Figure captions. (e.g. Fig. 1 the Grignard reaction setup with a 50 mL three-necked flask, an addition funnel (on the right), a reflux condenser, and a gas adapter).
   d. You should write exactly what you did. Do not take your procedure from the book or from any other groups, this is considered plagiarism.
7. Results (15 pts)
a. The results usually state any values that were obtained from the experiment (e.g. mass of product, melting points, etc.)
b. The results should include any calculations made (e.g. molar ratio, theoretical yield, percent yield etc.) and any tables or graphs that were obtained from the experiment.
c. You must show your entire calculation and all the steps taken. Do not mention just the final answer. Otherwise you will lose points.

8. Discussion (10 pts): Stating your results and interpret what your results and explaining why particular “good” or “bad” results were obtained. If bad, give recommendations on what can be done differently or should be avoided for experiment to give positive results. No more than 5 sentences.

9. Conclusions (5 pts): The conclusion section should be in paragraph form. No more than 3 sentences. The conclusion should restate the values in the results and should explain what these results mean. Summarize the success or failure of your experiment.

10. References (3 pts): List any references applicable to your report, which should be cited throughout your report where applicable.

Missing Lab
Students who miss a lab for an unexcused reason will lose 100% of the credit for that week. No makeup labs or makeup quizzes are provided for an unexcused absence, and you will not receive credit for a report submitted for a week that you miss. An excused absence would include, for instance, a sanctioned university activity that you must attend. For example if you participate in UTRGV sports, or if you are presenting research results at a conference. Other excused absences are the discretion of the instructor. For an excused absence, your instructor will offer the makeup lab in another section of the course which you can attend.

Or if you turn in the lab report using the data from your partner, this will be accepted with a 50% deduction (your wet work lab points)

UTRGV Policy Statements
STUDENTS WITH DISABILITIES:
If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades.

ATTENDANCE:
• Attendance is mandatory
• Absence from class is not considered an automatic drop
• Drop deadline: April 12

SCHOLASTIC INTEGRITY:
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating,
plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:
In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE DROPS:
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

• The syllabus can be subject at the discretion of the instructor. You are solely responsible for getting the most updated information regarding to the course.

Last update: 1/24/18.
UTRGV DEPARTMENT OF CHEMISTRY: LABORATORY SAFETY POLICY

1. Students are required to be covered from wrist to ankles. This means:
   - A lab coat that extends from the wrist to 10 inches below the bench top
   - Long pants without tears or holes that cover the tongue of the shoe.
     (No Leggings, Jeggings, Yoga pants, Capris, Tights, or Shorts).

2. Everyone is required to wear goggles or protective eyewear at all times when experiments are being conducted in the lab. Prescription lenses without side shields are not considered safety glasses. Safety glasses must have side shields.

3. Everyone is required to wear closed-foot shoes that cover the entire foot at all times in the lab. Must be footwear that does not readily absorb chemicals during a chemical spill. (No Sandals or Ballerina slippers).

4. Do not wear flammable garments, anything with synthetic fibers, or loosely woven natural fibers.

5. Food, drinks, and chewing gum are NOT allowed in Lab.

6. Students are required to tie back loose or long hair.

7. Students are not allowed to Text while conducting experiments.

8. Students violating any item(s) 1 through 7 will be noted by lab instructor. If the student’s name appears 3 times on the list, the student will be dropped from the lab. The student will check out at this time.

9. Students are required to observe cleanliness of the work area at all times. This includes their personal workspace, sinks, and the area in the back of the lab.

10. At the beginning of the semester, students will sign a document that declares understanding of the safety policies and consequences of policy violations. A signature is considered an agreement to abide by the policies and accept the consequences of violation of said policies.

I have read the “Laboratory Safety Policy” above for the UTRGV Chemistry Department. I agree to follow this policy. Failure to do so may result in removal from the course.

Printed Name: ________________________________
Signed Name: ________________________________ Date: __________

Printed Name: ________________________________
Signed Name: ________________________________ Date: __________