Organic Chemistry II Lab CHEM 2125-05  Dr. Chen Lin
Fall 2019  chen.lin@utrgv.edu  Office: ESCNE 3.104
Class  Office Hours
F 10:55 am - 1:35 pm  ESCNE 3.150  MTWR 9:30 am – 10:30 am & 2:00 pm – 3:00 pm

*Course Syllabus may be subject to change.

Required Lab Manual
(Available at UTRGV bookstore)

Course Description and Prerequisites
The second semester’s laboratory is designed to introduce organic synthesis to students. Students already learned fundamental techniques (crystallization, distillation, extraction, and chromatography) in CHEM 2123 course. These techniques are applied to the preparation and purification of organic compounds.
Prerequisites: CHEM 2325 (minimum Grade of D) or may be taken concurrently.

Learning Objectives for Organic Chemistry Lab
1. To become familiar with basic organic chemistry methods and techniques.
2. To learn safety and handling of chemicals in the laboratory.
3. To maintain a proper laboratory notebook and write a laboratory report.
4. To learn organic chemistry synthesis.
5. To develop communication skills, so that you are able to communicate your knowledge and understanding of chemistry to both your partners and your instructors.
6. To develop teamwork skills, so that you can effectively engage in and contribute to experimental activities.

Lab Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Exp. #</th>
<th>Experiment Title</th>
<th>Final Mass m.p.</th>
<th>Items Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 6</td>
<td>--</td>
<td>Syllabus &amp; Safety Rules CHECK-IN</td>
<td></td>
<td>Safety Agreement Check-in Sheet</td>
</tr>
<tr>
<td>Sep 13</td>
<td>1</td>
<td>Friedel Crafts Acylation</td>
<td></td>
<td>Prelab Quiz (PQ) #1</td>
</tr>
<tr>
<td>Sep 20</td>
<td>2</td>
<td>Nucleophilic Aromatic Substitution</td>
<td>Exp. #1</td>
<td>PQ #2</td>
</tr>
<tr>
<td>Sep 27</td>
<td>3</td>
<td>Synthesis of Acetaminophen</td>
<td>Exp. #2</td>
<td>PQ #3 &amp; Exp. #1 Report</td>
</tr>
<tr>
<td>Oct 4</td>
<td>4</td>
<td>Dyes and Dying</td>
<td>Exp. #3</td>
<td>PQ #4 &amp; Exp. #2 Report</td>
</tr>
<tr>
<td>Oct 11</td>
<td>--</td>
<td>Mid-Term Exam over Experiments 1-4</td>
<td></td>
<td>Exp. #3 Report</td>
</tr>
<tr>
<td>Oct 18</td>
<td>5</td>
<td>Fisher Esterification</td>
<td></td>
<td>PQ #5 &amp; Exp. #4 Report</td>
</tr>
<tr>
<td>Oct 25</td>
<td>6</td>
<td>Diels Alder Reaction</td>
<td></td>
<td>PQ #6 &amp; Exp. #5 Report</td>
</tr>
<tr>
<td>Nov 1</td>
<td>7</td>
<td>Nucleophilic Addition to Carbonyl Group</td>
<td>Exp. #6</td>
<td>PQ #7</td>
</tr>
<tr>
<td>Nov 8</td>
<td>8</td>
<td>Infrared and Nuclear Magnetic Resonance Spectroscopy</td>
<td>Exp. #7</td>
<td>PQ #8 &amp; Exp. #6 Report</td>
</tr>
<tr>
<td>Nov 15</td>
<td>--</td>
<td>CHECK-OUT</td>
<td></td>
<td>Exp. #7 Report</td>
</tr>
<tr>
<td>Nov 22</td>
<td>--</td>
<td>Final Exam over Experiments 5-8</td>
<td></td>
<td>Exp. #8 Report*</td>
</tr>
</tbody>
</table>

* The lab report for Exp 8 (IR and NMR) will be multiple choice quizzes on blackboard.
Learning Objectives for Core Curriculum Requirements
This course is not part of the UTRGV core curriculum requirements.

Blackboard
There is a Blackboard for this course. All materials will be accessible on it including Pre-lab quiz. 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 frequently (e-mail will only be sent to UTRGV accounts).

Course Requirements, Rules, and Regulations
- Students are expected to behave like adults and to show proper respect for their classmates. Any electronic device that generates sounds that are audible to other students will not be allowed in class. Please mute cell phones and alarms before coming to class. Under no circumstances will anyone carry on a telephone conversation during this class. In case of emergencies simply get up and leave the room as quietly and courteously as possible.
- There are no “dropped” lab grades in this laboratory course. Do your best to attend each lab. Plan to spend the entire period in lab. You and your partner may leave once you’ve completed an experiment. Please do not leave in advance of your partner.
- You can make up the lab in another section, while you only have two chances throughout the whole semester. You must make it up during the week that experiment is conducted. You need to inform me and the instructor who teaches the section you want to make-up and have the form signed. You must show a verifiable, and a legitimate reason for lab make-up. You need to turn your lab report with the signed make-up lab form to on time according to lab schedule.
- Lab Briefing. You are required to attend the lab briefing. Changes in procedure and potential pitfalls in the experiment will be mentioned. This could save you time and alert you to important aspects of the procedure and SAFETY. The briefing does not replace reading/preparation. If you miss the briefing, you are not allowed to do the lab, and you will receive a zero for the lab.

Safety Regulations:
- Safety goggles must be worn at all times in the lab. This is a State law. You do not have the choice to not comply. You are responsible for bringing your own goggles, they are NOT provided!
- Absolutely no eating, drinking, or smoking in the laboratory.
- Dress code will be enforced. You need to dress defensively: wear lab coats all the time; no shorts or sandals; restrict long hair and no hats. You will sign a safety agreement the first lab stating that you understand this. There will be absolutely no make-up labs due to the fact that you forgot to dress appropriately!
- Do not begin laboratory exercises unless your instructor is present.
- Follow the Experimental Procedures – do not perform unauthorized experiments!
- Locate and know how to use the safety equipment. Use these only in the event of an emergency.
- 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.
- 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.
Lab Stewardship:
– Do not “weigh” chemicals directly on balance surfaces; use weighing paper or beakers.
– Dispose of solid wastes in appropriately labeled containers – NOT in wastes basket!
– Dispose of liquid, organic wastes in appropriately labeled containers – NOT down the sink!
– Dispose of broken glassware in the designated box – NOT in wastes basket!
– Add reactive chemicals only to clean & dry beakers, flasks, graduated cylinders, etc.
– Use flames (Bunsen burners) only when authorized; most organic solvents are highly flammable!
– Do not leave experiments unattended.
– Put chemicals and equipment back to where you found them.
– Do not pour chemicals back into reagent containers.
– Clean up your and your partner’s work area before leaving.
– Use common sense – ask if you do not know!

Grading
Letter grades are given based on following scale:
A ≥ 90, 90 > B ≥ 80, 80 > C ≥ 70, 70 > D ≥ 60, F < 60

The distribution of the course grade is as follows:
Pre-lab Quizzes 10%
Wet Lab/Attendance 10%
Mid-term exam 20%
Final exam 20%
Lab Report 40%

Pre-Lab Quizzes
Pre-lab quiz will be administered online (Blackboard) for each lab. The quiz window will close on the time of the lab. If you missed or late submission = 0 points. You must submit your answers by 10:50 am on Fri. 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.

Wet Lab/Attendance
Participate in each experiment (No virtual labs). Collect your data in Lab Report sheets from Lab Manual.

Exams
2 exams will be given throughout the semester. They will be held during the regular meeting time of the course, and in the regular meeting place of the course, as indicated at the start of this syllabus. There will be about 20 multiple choices questions + some extra credit questions.
For all exams, A periodic table and important constants and equations will be provided to you. You will need your ID, a No. 2 pencil, an eraser, a calculator, and a scantron with you. The type of scantron you need to obtain is 100 Q DataLink 3000 and SideKick Answer Sheet (29240). You can purchase in bookstore. If it is not on shelf, you can ask for “Chemistry Scantron”. No other materials or devices are allowed. You cannot use cellphone as a calculator during an exam. If you use the wrong type of scantron or fail to bring a scantron, you will have 5 pt deduction in your exam score.
During the exam, you need to mute or turn off your cellphone/laptop/tablet, put it in your backpack, and put backpacks in the front of classroom. No food, drink, or chewing gums allowed. You should not sit right next to each other; make sure there is some space between you and your neighbor.
Make up exams, including exams to be taken early, will only be given due to one of the following conditions:
1. you have a major medical illness requiring immediate treatment;
2. there is a death of an immediate family member;
3. you must participate in a required university activity;
4. you are observing a religious holy day;
5. you are currently serving in the military.

Documentation is required for all of these cases. In the cases of your illness or a family member’s death, documentation is required when you return to campus. In the case of a required university activity, a religious holy day, or military service, documentation is required at least one week prior to the activity. In case a make-up exam is given, it will be at the discretion of the instructor and at a time convenient to her schedule. Please note, however, that a makeup exam might be different than the regularly scheduled exam.

Lab Reports
Your lab reports must be hand-written. 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 lab schedule. 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 \( \times 0.7 \)) if you submit within one week after due date. Any lab reports submitted one week later than the due date will receive a zero score.

Full Lab Report
The written lab report, as well as lab techniques and product quality will contribute to your lab grade. Remember to turn in the lab report at the beginning of the lab period after the experiment. Below is a general format of the sections and how they should appear. If you follow this guide, you are likely to improve your lab grade. Printed copy is not acceptable. The total points of each lab report are 50.

Always include section headers: Introduction, Reaction Mechanism, Results and Discussion, etc. All parts of lab report must be written in 3rd person. Do not say “I” or “me”.

Do NOT copy manual or your will get a zero for the whole lab report!

If safety regulation is violated, for example, you forget to bring your safety glasses or goggles, forget lab coat, dress improperly, bring in food and drink, etc. (check syllabus and safety agreement), 1 pt will be taken away from the corresponding lab report for each instance.

<table>
<thead>
<tr>
<th>Title of Experiment (1 pt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your name/your lab partner's name (0.5 pt)</td>
</tr>
<tr>
<td>Introduction (5 pt)</td>
</tr>
<tr>
<td>The purpose of this lab is... Briefly describe how you obtain product from your starting materials and how the product will be analyzed, as well as important parts of the experiment. Use complete sentences. 1 paragraph (5-10 sentences; if fewer than 5 sentences, 1 pt will be taken away for each sentence missing, e.g. 3 sentences for this part means 2 pt subtraction).</td>
</tr>
<tr>
<td>Reaction WITH mechanism (4 pt)</td>
</tr>
<tr>
<td>Mechanism must be with the chemicals YOU are using in lab. Only required when chemical reactions take place (not physical changes). If only reaction equation is shown without mechanism, 2.5 pt will be taken away.</td>
</tr>
</tbody>
</table>

*Table of Reactants and Products* (4 pt) Set up a Table of Reactants and Products as an aid in summarizing the amounts and properties of reagents and catalyst being used and the product(s) being formed. Only those reactants, catalysts, and products that appear in the main reaction should be listed in the table; many other reagents may be used in the work-up and purification of the reaction mixture, but these should not be entered in the table. Include the name, structure, molecular weight, boiling points,
melting points, density, and concentrations (if solution is used). *For those experiments that don’t involve a reaction, you should give the structure and relevant properties of compounds used.* Include all information listed in the lab note. (You can also use the table format shown in the lab note instead of the one below.) If one important piece of information is missing, 0.5pt will be taken away.

<table>
<thead>
<tr>
<th>Molecular weight g/mol</th>
<th>Density if applicable</th>
<th>Melting point °C if applicable</th>
<th>Boiling point °C if applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Names and structures of compounds used, as many as applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Products formed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Procedure and Observations* (20 pt) are next to each other (not procedure and then observation below it). Observations should correlate with the procedure step.

Procedures (No Plagiarism!)
- **Numbered step by step instructions**
  1. Heat to 156°C
  2. Dissolve in soln’
  3. 
  4. Weigh reagent
- **Does not have to be complete sentences**
- **One should be able to replicate experiment by what is written here**
- **Sketch & label major apparatus here as well**

Observations:
- Some examples
  - **In brief** - Change temp to 165°C
  - most dissolved, but not all-soln’ turned green
- actual wt 0.348 g (white powder)
  - **be aware of precision of instrument**
  - **Does not have to be complete sentences**
  - actual amounts used
  - colors, textures, odors
  - temperatures and times

Calculations (5 pt)
All math must be shown with the actual amount measured in lab. Examples are theoretical yield, percent recovery, percent yield, percent composition, Rf, etc. Watch precision of instrument and significant figures. You must show your entire calculation and all the steps taken. Do not mention just the final answer, otherwise you will lose points.
If significant figures rules are not followed, 0.5 pt will be deducted for every instance. Pay attention to units.

Results and Discussion (8 pt)
Calculated yields, measured physical properties, and graphical results should be shown here. 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. For example, m.p. measurement showed the final product was not pure. The reason was... The impurities in the final product might be... The percent yield was ...; it was not 100% because the product might be lost through... Answer questions listed at the end of lab note. Missing any information mentioned above will result in 1 pt deduction per instance. This part must have no fewer than 7 sentences, or 1 pt will be deducted from every sentence missing, e.g. 5 sentences in this part means 2 pt deduction.

Conclusions (2 pt)
Make a brief summary of results from the experiment, such as the identity of the product or unknown. Give evidence that supports your conclusion, for example melting point, yield, or other data. Use completely sentences. No more than 5 sentences.
Procedures
1. Do not take your procedure from the book or from any other, which is considered plagiarism.
2. The procedure should be a detailed description of what you did in lab. Notice that there will be a lot of changes in procedures. If you write a step you didn’t do, 1 pt will be taken away for each instance.
3. If applicable, insert tables, charts, and pictures with the appropriate descriptions to each one.
4. All set-ups must be described. If a picture of a set-up (glassware) is included in the report, you need to label each part of the set up. 2 points will be taken off for missing one important set-up, and 1 point will be taken off for set-up graphs without labeling.

Observations
Observations include color change, precipitation, reaction is exothermic, gas evolution, etc. Observation is the main thing to know you actually did the experiment. For example, in extraction you always need to label which is organic layer and which is aqueous layer, as well as the color of each layer. You also need to record the amount of reagent/time required for each step, the temperature, etc. with the correct units for each value. 2 points will be taken off for missing one important observation.
If recorded data don’t show proper number of significant figures, i.e., don’t match with the actual precision of the instrument, 0.5 pt will be taken away for every instance. For example, a balance is precise to 0.01 g, while you recorded a mass of 12.5 g, then points will be taken away.
All value must have units. Missing units result in 0.5 pt subtraction per instance.

Fall 2019 Academic Calendar
August 26  First day of classes
August 29  Last day to add a course or register for Fall 2019
September 2  Labor Day Holiday – NO classes
November 13  Last day to drop a course; will count toward the 6-drop rule
November 28 - 29  Thanksgiving Holiday – NO classes
December 5  Study Day – NO classes
December 6 - 12  Final Exams
December 13 - 14  Commencement Exercises

STUDENTS WITH DISABILITIES:
Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who experience a broken bone, severe injury, or undergo surgery during the semester are eligible for temporary services.

Pregnancy, Pregnancy-related, and Parenting Accommodations
Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services:
Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.
Edinburg Campus: Student Accessibility Services is located in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@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. Online evaluations will be available on or about:
Full Fall Semester      November 14th – December 4th

ATTENDANCE:
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC DISHONESTY:
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 (including self-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 Student Rights and Responsibilities.

SEXUAL MISCONDUCT and MANDATORY REPORTING:
In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (oie@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and 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 that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at 665-8287, 882-8282, or OVAVP@utrgv.edu.

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.
STUDENT SERVICES:
Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

<table>
<thead>
<tr>
<th>Center Name</th>
<th>Brownsville Campus</th>
<th>Edinburg Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advising Center</td>
<td>BMAIN 1.400</td>
<td>ESWKH 101</td>
</tr>
<tr>
<td><a href="mailto:AcademicAdvising@utrgv.edu">AcademicAdvising@utrgv.edu</a></td>
<td>(956) 665-7120</td>
<td>(956) 665-7120</td>
</tr>
<tr>
<td>Career Center</td>
<td>BCRTZ 129</td>
<td>ESSBL 2.101</td>
</tr>
<tr>
<td><a href="mailto:CareerCenter@utrgv.edu">CareerCenter@utrgv.edu</a></td>
<td>(956) 882-5627</td>
<td>(956) 665-2243</td>
</tr>
<tr>
<td>Counseling Center</td>
<td>EUCTR 109</td>
<td>BSTUN 2.10</td>
</tr>
<tr>
<td><a href="mailto:Counseling@utrgv.edu">Counseling@utrgv.edu</a></td>
<td>(956) 665-2574</td>
<td>(956) 882-3897</td>
</tr>
<tr>
<td>Learning Center</td>
<td>BMSLC 2.118</td>
<td>ELCTR 100</td>
</tr>
<tr>
<td><a href="mailto:LearningCenter@utrgv.edu">LearningCenter@utrgv.edu</a></td>
<td>(956) 882-8208</td>
<td>(956) 665-2585</td>
</tr>
<tr>
<td>Writing Center</td>
<td>BUBLB 3.206</td>
<td>ESTAC 3.119</td>
</tr>
<tr>
<td><a href="mailto:WC@utrgv.edu">WC@utrgv.edu</a></td>
<td>(956) 882-7065</td>
<td>(956) 665-2538</td>
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</tbody>
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