



COURSE INFORMATION FOR CHEMISTRY 2125 LAB:

ORGANIC CHEMISTRY II LAB

Spring 2019

Course: Chemistry 2125 laboratory:

Section 02L meets Tuesday 2:00 pm – 5:50 pm in STC 308

INSTRUCTOR INFORMATION

Instructor: Rafael Ortiz

Office Location: STC 301 ; Mailbox in STC 318

Office Hours: Monday 4:00-5:00 pm; Friday 1:00-2:00 pm

Office Phone: 903-886-5392

Email Address: jortiz4@leomail.tamuc.edu

COURSE INFORMATION

Text/ Manual and other required material:

- **Custom Lab Manual: CHEM 2125 - Lab Experiments - Organic Chemistry II**
9781337907361 Custom Lab Manual (Available in the bookstore) Purchase is required.
- **Supplies:** Safety Goggles and a combination padlock
- **A calculator**
- **Appropriate lab attire** (long pants without holes, no open-toed shoes, long hair tied back, no sleeveless shirts)
- **Lab coats (optional).**

Course description: A continuation of Chem 2123. Introduction of techniques for organic chemistry laboratory, including preparation, setup, and running reactions and the characterization of the properties of representative organic compounds.

Student Learning Outcomes/Course Objectives:

By the end of the semester I intend for my students to have realized a number of objectives.

- Learn basic synthetic organic chemistry techniques, such as how to set up reactions, how to monitor the progress of a reaction, how to calculate the amount of starting materials needed, how to calculate percent yields, and how to properly clean glassware at the end of an experiment.
- Learn basic techniques for the isolation and purification of organic molecules, such as distillation, recrystallization, chromatography (TLC and column), and extraction.

- Learn how to characterize organic compounds using techniques and instrumentation such as melting point, boiling point, retention factor, ¹H-NMR, ¹³C-NMR, IR, and UV/Vis spectroscopy.
- Learn the safety requirements and methods needed to work in an organic chemistry laboratory.
- Learn how to safely handle, utilize and dispose of chemicals.
- Learn how to document laboratory experiments, how to maintain a scientific notebook.
- Know the importance of organic chemistry and its relationship to various other disciplines such as biochemistry and medicinal chemistry and our daily lives.

COURSE REQUIREMENTS

Course specific procedures

The following are directions for preparing for the laboratory experiments. It is essential that you read these rules carefully and understand what is expected.

- It is essential to read the background information of the experiment and its procedure before coming to class.
- Labs cannot be done without safety glasses and gloves.
- Late arrival (more than 20 minutes) will result in forfeit of the grade for that lab.
- There will be 12 labs assigned with written lab reports (pre lab, data and post lab). **A minimum of 11 labs must be completed (with report) to pass the class.** Only initialed data sheet will be accepted.
- If you miss a laboratory experiment that will be your dropped laboratory report. If you miss more than one laboratory experiment, you will be assigned a grade of zero for that assignment. **It is the student's responsibility to inform the instructor of his/her absence before class starts.**
- Performing lab experiment without pre-lab report is not allowed.
- **No phones are allowed.**

Laboratory Notebooks: You must write down what you observe and measure during the time of the experiment. Compose the laboratory report in sufficient detail to allow someone else to repeat the experiment exactly. The observations section of the report must be the original notes taken during the course of the experiment (take detailed, **legible** notes during the experiment). Your notes **MUST** be signed by the TA after the experiment is completed.

Each laboratory report will consist of the following sections:

- Prelab Section – **40 points** (due at the beginning of the laboratory, **MUST** be signed by the TA before the experiment starts and returned back to the student)
 - Title – 2 points. The number of the experiment and its title, date of the experiment, student's name.
 - Objective – 3 points (The purpose of the experiment, method/skills)
 - Physical Constants/Reagent Data – 10 points. (Make a table to clearly list the chemical and physical properties of all the solvents and chemicals you will use. The properties include but are not limited to molecular weight, density, melting point, boiling point, color, phase, solubility, flammability, toxicity)
 - Stoichiometry/Theory – 5 points (Equation - 2 points; how much of each reactant should be used and what is the limiting reagent – 1 point. What is the theoretical yield by calculation – 2 points)
 - Safety – 5 points. (Read the special instruction part carefully so that you will not be injured. How to deal with the dangerous chemicals and operations should be listed clearly)

- Procedure – 15 points. (Itemize the procedure as an outline, do not copy the text book directly. You are encouraged to explain the key steps after the particular procedures)
- Postlab Section – **60 points** (MUST be completed by the beginning of the next laboratory period and submitted along with the pre lab report)
 - Modifications to procedure – 5 points (What modification did you made? Why did you make this modification?)
 - Observations – 15 points (List the phenomenon you have observed such as bubbles formed, the color of the mixture changed from colorless to rose, two layers were formed from one phase, green crystals formed and so on)
 - Results – 10 points. (What’s the physical property of your product (color, phase melting point)? How much product did you get in this part? (You should show your original data and the calculation process; three significant digits after the decimal are required. Calculate your actual yield)
 - Laboratory notes – 10 points
 - Discussion – 20 points (Explain the phenomenon you have observed; explain the results in terms of the purpose of the experiment; compare the expected results with the actual results (for example, compare the theoretical and the actual yields); explain how the purity and identity of the compound was assessed (10 points). Interpret the IR and H-NMR spectra (5 points). Answer the assigned problems according to the syllabus (5 points).

GRADING

Your laboratory grade will be based on 8 of your best experimental write-ups (lab reports) out of 9 (80%) and spectroscopy problems (20%).

Lab reports (prelab and postlab):	80%
<u>Spectroscopy problems:</u>	<u>20%</u>
	100%

You are required to submit lab reports in a timely manner. Late Post-Lab reports will not be accepted! **A written explanation (that is pre-approved by the instructor) for the late post-lab report is the only exception. There will be absolutely no make-ups for laboratory experiments. If you miss a laboratory experiment, it will count as your dropped laboratory write-up. If you miss more than one laboratory experiment, you will be assigned a grade of zero for that assignment.**

See the following website for more details about course withdrawal deadlines: <http://www.tamuc.edu/admissions/registrar/academicCalendars/>.

Grading will be based on a standard percentage scale: 100-90 = A; 89-80 = B; 79-70 = C; 69-60 = D; 59-below = F. Dishonest scholarship will earn an automatic zero (0) and initiate prosecution to the fullest extent. Incomplete grades may be given only if the student has a current average 70% and is precluded from completion of the course by a documented illness or family crisis.

Lab Cleanliness: You will be expected to maintain a clean and orderly lab. At the end of every experiment, your bench space and hood space must be cleaned. Any equipment utilized during the experiment must be cleaned as well (balances, rotovaps, etc.). You should ensure that sinks and floors are also clean. **If the lab space and equipment that you utilized during the experiment is left dirty and unorganized, you will be penalized 20% on your lab report associated with that experiment.**

TECHNOLOGY REQUIREMENTS

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

-  Ensure that your browser has JavaScript and Cookies enabled.
- 1. For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- 1. The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or point release of that major version) and the previous major version of iOS (the latest minor or point release of that major version). For example, as of June 7, 2017, D2L supports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

1. You will need regular access to a computer with a broadband Internet connection.

The minimum computer requirements are:

1. 512 MB of RAM, 1 GB or more preferred
2. Broadband connection required courses are heavily video intensive
3. Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

2. You must have a:

1. Sound card, which is usually integrated into your desktop or laptop computer
2. Speakers or headphones.
3. *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

3. Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: [JAVA web site http://www.java.com/en/download/manual.jsp](http://www.java.com/en/download/manual.jsp)

4. Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.
JavaScript is enabled.
Cookies are enabled.

5. You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
 1. [Adobe Reader](https://get.adobe.com/reader/) <https://get.adobe.com/reader/>
 2. [Adobe Flash Player](https://get.adobe.com/flashplayer/) (version 17 or later) <https://get.adobe.com/flashplayer/>
 3. [Adobe Shockwave Player](https://get.adobe.com/shockwave/) <https://get.adobe.com/shockwave/>
 4. [Apple Quick Time](http://www.apple.com/quicktime/download/) <http://www.apple.com/quicktime/download/>
6. At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

Access and Navigation

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

Communication and Support

Brightspace Support

Need Help?

Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, contact Brightspace Technical Support at 1-877-325-7778 or click on the **Chat** or click on the words “click here” to submit an issue via email.



System Maintenance

D2L runs monthly updates during the last week of the month, usually on Wednesday. The system should remain up during this time unless otherwise specified in an announcement. You may experience minimal impacts to performance and/or look and feel of the environment.

COMMUNICATION AND SUPPORT

Communication: If the instructor needs to contact an individual student, it will be via the student's e-mail account. Students should check e-mail frequently, especially after absence. E-mail is the best, easiest and fastest way to communicate with me.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

Class Attendance Policy

All students are expected to attend class on a regular basis and attendance will be recorded. The Department of Chemistry adheres to the attendance policy set by the University as stated in the most current Undergraduate Catalog. You must be on time in order to take an exam. Excessive absence is defined as missing more than 10% of the laboratory sessions without excusable reasons. Good class attendance will be necessary in order to pass the course.

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Student Conduct Policy

Students are required to turn off all cell phones, MP3 players, PDA's, Pagers, computers and any other electronic devices before entering the class or in the laboratory that might disrupt class or disturb others.

If the student is failed to comply with the code of conduct and being disrespectful, disruptive to the instructor or the students of the class, the instructor reserves the right to dismiss the student from the class on the first offense. A second offense may constitute dismissal from the course with a failing grade.

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: [Netiquette http://www.albion.com/netiquette/corerules.html](http://www.albion.com/netiquette/corerules.html)

Academic Integrity and Dishonesty Policy

Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result in suspension or expulsion from the University. Students at Texas A&M University-Commerce are expected to maintain high standards

of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: StudentDisabilityServices@tamuc.edu

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Statement

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity expression will be maintained

Campus Concealed Carry

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web

url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

**Tentative Lab Schedule for CHEM 2125
Spring 2019**

<i>Week</i>	<i>Day of the Week</i>	<u><i>Experiments & Assigned Problems</i></u>
1	01/15/19	Syllabus, safety lecture & safety quiz, check-in
2	01/22/19	No lab. Martin Luther King Jr. Day
3	01/29/19	Experiments 17 B and 18 A. Training on how to use computational chemistry software Spartan (second floor computer lab). Read all of chapter 17 and 18 before class. Conduct exercises 17B and 18 A. Read the essays in the chapters before class.
4	02/05/19	Combinatorial Chemistry. A handout will be given out and uploaded in D2L that describes this lab and its procedure. Record an IR and ¹ H-NMR spectrum of your ester and interpret the spectrum for your post-lab report
5	02/12/19	Oxidation of Alcohols. A handout will be given out and uploaded in D2L that describes this lab and procedure.
6	02/19/19	Experiment 34. Read all of experiment 34. Conduct experiment 34: Aqueous-Based Organozinc Reactions. Answer questions 1-4 in your post-lab report.
7	02/26/19	Experiment 42. Conduct experiment 42. Relative Reactivities of Several Aromatic Compounds. Read all of experiment 42. Answer questions 1-3 in your post-lab report.
8	03/05/19	Experiment 41B. Read all of experiment 41. Conduct experiment 41B: 1,4-diphenyl-1,3-butadiene (Wittig reaction). Answer questions 1-5 in your post-lab report. Set up experiment 32A

The next 3 labs will test your synthetic chemistry skills as the product from one experiment will be utilized for the next experiment! So hopefully you have material at the end of each lab that will serve as your starting material for the subsequent lab.

9	03/12/19	Experiment 32A. Read all of experiment 32: Multistep Reaction Sequences: The Conversion of Benzaldehyde to Benzoic Acid. Conduct experiment 32A. KEEP your product at the end of this experiment because you will use it next experiment. Answer questions 1 and 4 in your post-lab report
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10	03/19/19	No labs. Spring break
Week	Day of the Week	<u>Experiments & Assigned Problems</u>
11	03/26/19	Experiment 32B. Conduct experiment 32B: Preparation of Benzil. Use your product from last week as this week starting material. KEEP your product at the end of the experiment because you will use it next experiment.
12	04/02/19	Experiment 32C. Conduct experiment 32C: Preparation of Benzilic Acid. Use your product from last week as the starting material. Obtain yields from each individual step and the overall yield for the three step reaction for your report. Answer questions 1-3 in your post-lab report.
13	<u>04/09/19</u>	Experiment 50AB. Read the essay on pages 382-391: Polymers and Plastics. Conduct experiments 50A and 50B: Polyesters and Polyamide (Nylon). Answer questions 1-7 in the post-lab report. Set up and experiment 16.
14	04/16/19	Experiment 16. Read the essay on page 116-118: Ethanol and Fermentation Chemistry. Complete experiment 16 which was started last week. Answer questions 1-6 in your post-lab write-up.
15	04/23/19	Experiment 37. Read all of experiment 37. Conduct experiment 37: The Aldol Condensation: Preparation of Benzalacetophenones (Chalcones). Answer questions 1, 2, and 4 in your post-lab report. Spectroscopy Problems due.
16	04/30/19	Check out