



COURSE INFORMATION FOR CHEMISTRY 2125 LAB:

ORGANIC CHEMISTRY II LAB

Spring 2018

Course: Chemistry 2125 laboratory Section 01 meets in STC 308, Monday 2:00 pm – 5:50 pm

Instructor: Olga Savina

Office Location: STC 344

Office Hours: M/T 1:00 pm - 2:00 pm, R 5:00 pm - 6:00 pm or by appointment

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COURSE INFORMATION

Text/ Manual and other required material:

- **Lab Manual:** *Introduction to Organic Laboratory Techniques: A Small-Scale Approach*, Pavia/Lampman/Kriz/Engel, ISBN: 978-1-30525392-6 (3rd edition is also acceptable, ISBN 978-1-4390-4932-7)
- **Supplies:** Safety Goggles and a combination lock (two per group)
- **Calculator**
- **Appropriate lab attire** (long pants, 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. Prerequisites: Chem 2323 with minimum grade of C, Chem 201 with minimum grade of C and Chem 2123 with minimum grade of C. Corequisites: Chem 202, Chem 2325.

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.

GRADING

Your laboratory grade will be based on 11 of your best experimental lab reports out of 12 (80%) and spectroscopy problems (20%).

Lab reports (pre-lab and post-lab):	80%
<u>Spectroscopy problems:</u>	<u>20%</u>
	100%

You are required to submit lab reports in a timely manner. You will incur a 10% penalty for every day that your lab report is late; thus, if a lab report is 7 days late, you will receive a zero for that report. There will be absolutely no make-ups for laboratory experiments. If you miss a laboratory experiment, it will count as your dropped laboratory lab. If you miss more than one laboratory experiment, you will be assigned a grade of zero for that assignment. The student should notify the instructor of his/her absence before lab starts. 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 $\geq 70\%$ 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.**

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

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). You can also submit a typed version of your observations if you wish, but you **MUST** submit your original notes taken during the experiment.

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). You are not allowed to start the experiment without the pre-lab report.
 - Title – 2 points (the number of the experiment and its title, date of the experiment, student's name, course/section, TA's name, instructor'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, 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 won't be injured. How to deal with the dangerous chemicals and operations should be listed clearly.)
 - Procedure – 15 points. (Itemize the procedure as an outline (Don't 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 make? Why did you make this modification?)
 - Observations – 10 points (In writing down your observations use complete sentences. 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 with the identification of the step of the procedure).
 - Results – 10 points (What's the physical property (melting point, color, phase) of your product? 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.)
 - Discussion – 20 points (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 yield). Explain how the purity and identity of the compound was assessed. Interpret the IR and/or H-NMR spectra.
 - Assigned questions according to the syllabus – 5 points.
 - Laboratory Notebooks – 10 points (attach your lab notes with the signature of the TA).

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>

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>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<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

StudentDisabilityServices@tamuc.edu

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 2018***

<i>Week</i>	<i>Day of the Week</i>	<i><u>Experiments & Assigned Problems</u></i>
<i>1</i>	<i>01/15/18</i>	<i>Lab will not meet this week since Monday is a holiday</i>
<i>2</i>	<i>01/22/18</i>	<i>Syllabus, safety lecture & safety quiz, check-in</i>
<i>3</i>	<i>01/29/18</i>	<i>Experiments 17 and 18. 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.</i>
<i>4</i>	<i>02/05/18</i>	<i>Combinatorial Chemistry. A handout will be given out that describes this lab and its procedure. Read the essay on page 77. Record an IR and ¹H-NMR spectrum of your ester and interpret the spectrum for your post-lab report.</i>
<i>5</i>	<i>02/12/17</i>	<i>Oxidation of Alcohol. A handout will be given out that describes this lab and procedure.</i>
<i>6</i>	<i>02/19/17</i>	<i>Experiment 34. Read all of experiment 34. Conduct experiment 34: Aqueous-Based Organozinc Reactions. Answer questions 1-4, page 289, in your post-lab report.</i>
<i>7</i>	<i>02/26/17</i>	<i>Experiment 42. Conduct experiment 42. Relative Reactivities of Several Aromatic Compounds. Read all of experiment 42. Answer questions 1-3, page 335, in your post-lab report.</i>
<i>8</i>	<i>03/05/17</i>	<i>Experiment 41B. Read all of experiment 41. Conduct experiment 41B: 1,4-diphenyl-1,3-butadiene (Wittig reaction). Answer questions 1-5, page 330, in your post-lab report. Set up experiment 32A.</i>
<i>9</i>	<i>03/12/18</i>	<i>Spring Break</i>

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.

Week	Day of the Week	<u>Experiments & Assigned Problems</u>
10	03/19/17	<i>Experiment 32A. Read all of experiment 32: Multistep Reaction Sequences: The Conversion of Benzaldehyde to Benzilic Acid. Conduct experiment 32A. KEEP your product at the end of this experiment because you will use it next week. Answer questions 1 and 4 page 268-269, in your post-lab report.</i>
11	03/26/18	<i>Experiment 32B. Conduct experiment 32B: Preparation of Benzil. Use your product from last week as this weeks starting material. KEEP your product at the end of the experiment because you will use it next week.</i>
12	04/02/18	<i>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 page 273-274, in your post-lab report.</i>
13	4/09/18	<i>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 (page 400). Set up experiment 16, which you will complete next week.</i>
14	04/16/18	<i>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 (page 123).</i>
15	04/23/18	<i>Experiment 37. Read all of experiment 37. Conduct experiment 37: The Aldol Condensation: Preparation of Benzalacetophenones (Chalcones). Answer questions 1, 2, and 4, page 309, in your post-lab report.</i>
16	04/30/18	<i>A spectroscopy exam. Check out.</i>

Note: Instructor reserves the right to make any changes of the syllabus.