TEXAS A&M UNIVERSITY COMMERCE

COURSE INFORMATION FOR CHEMISTRY 2123 LAB:

ORGANIC CHEMISTRY I LAB

Fall 2024

INSTRUCTOR INFORMATION

Instructor: Dr. Bukuo Ni
Office Location: Science 303
Office Hours: Monday and Thursday: 9:00am-11:30am or by appointment.
Office Phone: 903-886-5382
University Email Address: Bukuo.Ni@ tamuc.edu

COURSE INFORMATION

Course: Chemistry 2123 laboratory sections meet in STC 308
Section 01L: Monday 2:00 pm – 5:50 pm
Section 02L: Tuesday 2:00 pm – 5:50 pm
Section 03L: Wednesday 2:00 pm – 5:50 pm
Section 04L: Thursday 2:00 pm – 5:50 pm

Text/ Manual and other required material:

- **Custom Lab Manual**: **CHEM 2123** - Lab Experiments - Organic Chemistry I: A Small-Scale Approach to Organic Laboratory Techniques, Fourth Edition, by Pavia | Lampman | Kriz | Engel, ISBN: 978-1-337-90735-4 (Available in the bookstore)
- **Supplies:** Safety Goggles and a combination lock
- **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: 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, ^{1}H-NMR, ^{13}C-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

- In the lab, you will work in small groups to complete the laboratory experiment for that day. You will be required to work in groups of 2-3 students. Groups made of more than 3 students will not be allowed.
- It is required to read the background information of the experiment and its procedure before coming to class. Performing lab experiment without pre-lab report is not allowed. Pre lab reports should be submitted before the instructor's lecture.
- The observations and data sections of the report must be the original notes taken during the course of the experiment. No typed or photocopied reports will be accepted.
- Every student will write his/her individual pre and post lab reports.
- Up to 25 points will be subtracted from your post lab report for non-participation in lab activities.
- There will be 9 labs assigned with written lab reports (pre lab, data and post lab). **A minimum of 8 labs must be completed (with report) to pass the class.** Only initialed data sheet will be accepted.
- You are required to submit Post Lab Report in a timely manner. For example, Wednesday lab report is due on next week Wednesday.
- You will incur a 10% penalty for every day that your lab report is late; thus, if a lab report is more than 10 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 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.** See the following website for more details about course withdrawal deadlines: http://www.tamuc.edu/admissions/registrar/academicCalendars/.
- Late arrival (more than 20 minutes) will result in forfeit of the grade for that lab.
- **No phones are allowed.**

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.**

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 title of the experiment, student's name, date)
  - 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 – 10 points (For the preparative experiment, equation - 2 points; how much of each reactant should be used and what is the limiting reagent – 3 points. What is the theoretical yield by calculation – 5 points). Provide theoretical background of the experiment if the purpose of experiment is learning organic chemistry techniques.
  - 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 – 10 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). This rubric may be organized as a T-chart: Procedure steps/Observations

- Post lab 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? (appearance: 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 (90%) and spectroscopy problems (10%).

Lab reports (prelab and postlab): 90%

Spectroscopy problems:	10%
	100%

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 of 70% and is precluded from completion of the course by a documented illness or family crisis.

COURSE OUTLINE / CALENDAR

Tentative schedule for online lab:

Tentative laboratory schedule for CHEM 2123

Week	***Day of the Week***	***Name of the Experiments***
1	8/26-8/30	*Check in equipment, watch lab safety video and take safety quiz. Laboratory write-up instructions*
2	9/2-9/6	*Experiment 1. Solubility: Read all of Experiment 1. Write the report up as described in Experiment 1, answer questions 1-5 in the report*
3	9/9-9/13	*Experiment 2. Crystallization: Read all of Experiment 2. Write the report up as described in the Experiment 2, answer questions 1-3 in the report*
4	9/16-9/20	*Experiment 3. Extraction: Read all of Experiment 3. Write the report up as described in Experiment 3, answer question 1 in the report*
5	9/23-9/27	*Experiment 15. Chromatography: Read Experiment 15 background information. Read the essay 'Chemistry of Vision' Answer questions 1-4 in the report.*
6	9/30-10/4	*Experiment 20A. Nucleophilic Substitution Reactions: Read All of the Experiment 20A.*
7	10/7-10/11	*Experiment 20B & 20C. Nucleophilic Substitution Reactions: Read All of the Experiment 20B & 20C. Answer questions 1-9 in the report.*
8	10/14-10/18	*No Labs. Chapter 12. Lecture over Infrared Spectroscopy and Mass Spectrometry.*
9	10/21-10/25	*Set up for the Experiment 27A.* *Chapter 13. Lecture over NMR Spectroscopy.*
10	10/28-11/1	*Experiment 27A. Chiral Reduction of Ethyl Acetoacetate: Read All of the Experiment 27A. Answer questions 1-3 in your report. Read the essay 'Green Chemistry'.*
11	11/4-11/8	*Experiment 47. Benzocaine: 'Read All of the Experiment 47, answer questions 1-5 in your report. Read the essay 'Local Anesthetics.'*
12	11/11-11/15	*Experiment 33A. Triphenylmethanol: 'Read All of the Experiment 33A, answer questions 1-5 in your report.*

13	11/18-11/22	***Check out and Spectroscopy problems due***

1. **You must bring a lock to your first laboratory meeting.**
2. **Safety goggles, long pants and closed toed shoes are required to be worn during all laboratory experiments.**
3. **The following lab number and name is based on custom lab manual from campus book store.**

TECHNOLOGY REQUIREMENTS

LMS – myLeo Online – D2L Brightspace

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements
LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements
LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm
YouSeeU Virtual Classroom Requirements:
https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

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

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, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: https://community.brightspace.com/support/s/contactsupport

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.

University Specific Procedures

Student Conduct

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

TAMUC Attendance

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

Academic Integrity

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

Students with Disabilities

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
Velma K Waters 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/

Nondiscrimination Notice
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, or gender expression will be maintained.

Campus Concealed Carry Statement
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.

A&M-Commerce Supports Students' Mental Health
The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

AI use policy
Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course. Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism). Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed. In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.
13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty