CHEM 339: Intermediate Organic Chemistry Laboratory

Fridays 1:00 PM – 16:50 PM in SC 4335
Fall Semester 2025

Prerequisites: CHEM 336 and CHEM 337
Textbook: None; selected readings from *Organic Chemistry Laboratory Techniques* and assigned research papers
Lab notebook: a bound laboratory notebook with sequentially numbered pages

Instructor: Asst. **Prof. Stan**islav Presolski
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Office Hours: Fri 10:30am – 12:00am or by appointment with an Outlook Calendar invite

Course catalog description and Learning goals:

Structure, reactions and their mechanisms, preparation and properties of alcohols, ethers, aldehydes, ketones, carboxylic acids and their derivatives, amines, conjugated and aromatic compounds. Laboratory emphasizes synthetic techniques and spectroscopic characterization and identification of compounds using IR, mass spectrometry, and ^{1}H and ^{13}C NMR. One hour of laboratory lecture and one three-hour lab. CHEM 334 and CHEM 337 comprise a traditional two-term organic chemistry lecture sequence with the CHEM 336 and CHEM 339 labs. Not open to students who have successfully completed CHEM 332. Prerequisites: CHEM 336 and CHEM 337. Lab/Class fee ($120) will be assessed. On successful completion of the course **a student should be able to**: safely synthesize and purify organic molecules of various complexity, decipher their spectroscopic signatures, plan synthetic transformations based on observed properties and reactivity profiles, as well as keep an accurate lab notebook, extract relevant information from published procedures, and succinctly report their findings through text and properly annotated spectral evidence.

Grading scheme: <-- A/A- ≥ 90%, B+/B/B- ≥ 80%, C+/C ≥ 70%, D+/D ≥ 60%, F< 60%
Lab Exam: 10% <-- organic spectroscopy, during our lab session on Dec. 5th
Notebooks: 20% <-- maintaining a proper lab notebook with contemporaneous observations
Pre-lab Prep: 30% <-- readings, calculations, and synthetic procedure write-up due by lab start
Lab Reports: 40% <-- 4 long-form lab reports due at 11:00 PM; one can be resubmitted for a regrade

Late assignment policy:

Your assignment will be considered late, if it misses the deadline without an appropriate note from a medical professional. The late penalty for this course is 20% of the assignment points per day, including weekends.

Lab safety:

Entrance to the labs will only be granted to those who have completed the online safety training and wear appropriate clothing, which minimizes the risk of severe bodily harm if an accident happens. That includes closed-toe shoes, long pants or skirts that cover your ankle, and a top leaving no skin exposed from the shoulders down. Safety **goggles must be worn at all times** and protective gloves should be used as instructed. Any accidents, even if they seem minor, must be reported to the instructor immediately. No food or drink of any kind is permitted in the laboratory. Students will be denied access or asked to leave, if they do not adhere to these rules or are in a physical/mental state that endangers them or is disruptive.

Motivation:

Science is about asking questions, not simply following procedures that "work perfectly" every time! So now that you have mastered most of the basic lab skills, you should start adapting procedures, analyzing real-world noisy spectra, getting over "failures", and celebrating when things work out, i.e. being a scientist. While benefiting from the scientific method and modern spectroscopy, organic synthesis is in many aspects still an art (just like cooking or painting), which can make it rather confusing or even intimidating at first. This course will provide you with the opportunity to engage in multistep synthesis of complex molecules that will build your confidence in reading scientific papers, planning your experiments, as well as collecting and presenting evidence of your success. As such it should allow you to stay one step ahead of AI…for now

Health, Wellness, and Inclusion:

While academic work is a very important aspect of your college education, your physical and mental health should always be a top priority. No assignment, lab report or exam preparation is worth you skipping a meal or going without sleep! If you find that the course is extremely challenging and you are failing to cope with the workload, talk to your instructor and your classmates for more effective study strategies, help with planning or additional tutoring. And if you are experiencing undo stress or feel you might benefit from private counseling, please contact the TU Counseling Center: https://www.towson.edu/counseling/

Pregnant students should consult their physicians for advice on whether or not to perform experiments in the laboratory. Students are encouraged to provide their physician with a list of the chemicals that they might be exposed to while in lab. They should also check the MSDS sheets (available in the Department) to be aware of the hazards of the chemicals. If a student is advised against performing laboratory work, then faculty will make appropriate accommodations for the student. Any accommodations should comprise a workload that is approximately equivalent to the regularly scheduled laboratory work, such as:

- Performing "dry" experiments only, in a place free from exposure to ongoing experiments
- Performing a particular wet chemistry experiment at a later date
- Receiving an incomplete grade in the course pending completion of experimental work

Students with any sort of disability who may need special consideration must see *the instructor during the first week of class* with appropriate paperwork. This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Accessibility & Disability Services (ADS). Students who suspect that they have a disability, but do not have documentation are encouraged to contact ADS for advice on how to obtain appropriate evaluation. A memo from ADS authorizing your accommodation is needed before any accommodation can be made.

The students, faculty, and staff at Towson University represent a diverse and vibrant community of learners and scholars. As a community, we value the unique contributions of each individual and promote active participation in all aspects of the learning process by each community member. Your instructor supports TU's goal of fostering a diverse and inclusive educational setting and the action plan of the Department of Chemistry & Forensic Science, and strives to create a classroom environment built upon the principles of mutual respect and support. Toward this end, all participants in this course are expected to demonstrate respect for all other members of the class. If you feel these expectations are not being met, please speak with your instructor or Dr. Cindy Zeller (czeller@towson.edu), the designated diversity liaison.

Attendance:

Attendance in this laboratory course is **mandatory**. Failure to attempt any lab period without a Towson University sanctioned excuse or prior arrangements with the instructor will result in a grade of ZERO for all work that should have been performed during that laboratory period. Furthermore, late arrival to prelab/lab is not permitted and any student arriving late may be excluded, at the instructor's discretion. Note that students are still responsible for any course material they may have missed due to an excuse.

No audits will be granted for this course. After the end of the add/drop period, students must either remain in the course to receive a final grade or choose to withdraw before the university deadline (Nov. 3rd, 2025).

Academic integrity:

The work that you present and submit must be your own! Details on proper citation and what constitutes "original work" will be discussed in class or provided for each assignment, with specific penalties for minor omissions/transgressions. Cheating on exams and mindlessly copying from natural or artificial intelligence sources does you harm, as it is akin to driving around the gym hoping to stay in shape. Moreover, violations of TU's policies on academic integrity carry significant penalties (such as a ZERO on an assignment or an F for the entire course) and must be reported to the Office of Student Accountability & Restorative Practices: https://www.towson.edu/about/administration/policies/03-01-00-student-academic-integrity-policy.html

Laboratory Notebook:

Maintaining a proper laboratory notebook is one of the most important skills for any scientist. The key feature of a well-maintained laboratory notebook is that another person could easily follow and understand exactly what you have done or observed and could, if necessary, repeat your experimental procedure. For this reason, it is important that you learn good laboratory notebook practices now, as these skills will then carry over into subsequent laboratory courses and will hopefully be applicable in your future career.

For this course, you will need a bound laboratory notebook with sequentially numbered pages; appropriate notebooks can be obtained at the university bookstore or through the Student Affiliates of the American Chemical Society (SAACS) club. If you have a partially filled laboratory notebook from a previous course, then you may continue to use that notebook for this course.

All entries in your notebook must be fully legible and written in either blue or black ink. If you make a mistake, cross it out with a single neat line and initial the entry nearby to acknowledge the error. If your notebook has a carbon copy paper, make sure to insert the back cover of your notebook after the carbon copy before you begin writing, so that you do not make stray marks on subsequent sheets. You will also find a table of contents at the beginning of your notebook, and if you keep it up to date, you can easily find relevant information when you are writing lab reports.

Miscellaneous:

A lab fee of $120 is charged for top loading balances, melting point capillaries, replacement of broken glassware and chemicals, melting point apparatus, stirring hotplates, instrumentation, repair/maintenance, instrument supplies, lab consumables, safety equipment and miscellaneous laboratory equipment: https://www.towson.edu/provostbudgetoffice/tu_class_lab_fee_ay_2025_2026_revised_april_3_2025.pdf

Assignments will be administered online via Blackboard. Therefore, a computer with stable internet access is required for this course. Should you encounter any issues related to technology, Towson University's Office of Technology Service may be able to help: https://www.towson.edu/technology

All information, schedules, dates, and policies outlined in this syllabus are subject to change. Any changes will be announced in writing via e-mail, and a revised version of the syllabus will be posted on Blackboard.