Instructor: William Chain (010 LDL, 831-0873, wchain@udel.edu)
Office Hours: 10:30 am – 12:00 pm, Tuesdays
Lectures: 8:40 am – 9:55 am, M/W, 207 BRL

Lecture notes and course materials will be posted on the course website shortly before or directly after lecture.

Website: The course website is available via Sakai@UD or via this link: https://sakai.udel.edu/portal/site/e40c2d7b-d310-4b14-8d0e-764e1d3079b4
The website will be updated regularly with announcements, lecture materials, problem sets, answer keys, grade updates, etc. Check back often.

Textbooks: All texts are On Reserve in the Chemistry Library.

Required
Strategic Applications of Named Reactions in Organic Synthesis. Kurti, L.; Czako, B.

Recommended

Model Kit: The use of a molecular model kit on exams, homeworks, and your final project is allowed and encouraged. You are free to use any model kit you like. I recommend the following kit, it gives a fairly accurate representation and it is rigid. HGS 4010/Student Set – http://www.maruzen.info/hgs/catalog/product_info.php?cPath=11&products_id=596

Grades: Midterm Exam 1 (3/2) 200 points
Midterm Exam 2 (4/6) 200 points
Midterm Exam 3 (5/4) 200 points
Synthesis Proposal (Due 5/11) 200 points
Problem Sets 100 points
Final Exam (date TBA) 300 points
Total 1200 points

Synthesis Proposal: You will prepare a proposal detailing the laboratory synthesis of a natural product of your choosing. The proposal will be prepared in the form of a JACS full paper, with complete details on your synthetic route – reagents, conditions, etc., with alternate strategies where necessary or appropriate. Molecules that offer the opportunity to propose new chemistry are encouraged. Pick your molecule in consultation with the chemical literature and with me – but no later than April 27! Your full proposal is due May 11. Further instructions will be available shortly.

Midterms and Final: Closed notes, closed book exams. The use of molecular model kits is allowed! There will be three midterm exams, administered approximately every four weeks. There will also be a comprehensive final exam. **There will be no make-up exams.** Instead, an exam score will be manufactured from your final exam score. This score will replace your lowest normalized midterm exam score, or serve to
replace a zero should you miss an exam for a valid medical excuse. Therefore, your final exam can weigh between 25% and 42% of your final grade, whichever is to your advantage.

Exams will cover lecture materials, problem sets, readings, and current literature discussed in lecture and available to you online (you should be reading all the time!). Tip: Take a dip in the chiral pool.

**Problem Sets:** There will be 8 problem sets, 12 points each. The remaining 4 points (for a total of 100 points available in problem sets) will be awarded for turning in a genuine attempt on each and every problem assigned during the course of the semester. A key will be posted for each problem set. It is your responsibility to make sure you understand these answers once the key is posted. Do keep in mind that due to the nature of this subject, there may be multiple valid answers. You may work in study groups when working on the problem sets, but each student must turn in his/her own work. Note that on the exams, you are on your own. Do not become reliant on help!

Do not use Reaxys, SciFinder Scholar or consult the literature to find the answers, unless specifically directed to do so. We are trying to develop synthetic skills, not google prowess.

Problem sets are due at the beginning of class on the due date. Late problem sets will not be accepted as we may discuss the answers in class after they are due. You will constantly asked to design synthetic routes to target compounds starting with commercially available materials. For our purposes, limit these commercially available materials to those available from Acros, Aldrich, Fisher, Strem, Alfa-Aesar, or TCI.

**Regrade Requests:** All regrade requests must be submitted in writing by the beginning of the next lecture after the exams or problem sets are returned. The entire exam or problem set will be regraded. If grading errors are found, the revised grade may be higher or lower than the original score. If submitting a regrade request, do not change your exam or problem set in any way; exams will be photocopied before being returned to you.

**Academic Dishonesty:** *I have a zero tolerance policy toward academic dishonesty.* Do not plagiarize or cheat. Any student who commits academic dishonesty will be punished according to the University of Delaware’s guidelines ([http://www.udel.edu/stuguide/09-10/code.html#honesty](http://www.udel.edu/stuguide/09-10/code.html#honesty)). *This document serves as your only warning – There will be NO second chances and NO exceptions to this policy*

**CHEM 635 Course Learning Goals**

After successful completion of this course, a student should be able to:

1. Understand principles of retrosynthesis and be able to splan synthetic routes to complex organic molecules (1,2)
2. Understand absolute and relative molecular stereochemistry and its importance in synthetic chemistry (1)
3. Understand the use, installation and removal of protecting groups in organic synthesis (1)
4. Be familiar with the methods and reactivity associated with alkyl groups, carbonyl groups, enolates, alkenes, alkyynes, amines, amides, esters, ethers, aromatic rings, and strained rings (1)
5. Be familiar with nucleophilic substitution chemistry, radical chemistry, methods for oxidation and reduction, elementary organometallic chemistry, pericyclic reactivity, asymmetric catalysis, and functional group interconversion (FGI), as they pertain to organic synthesis (1)
6. Be familiar with uses and application of major electronic databases used in organic chemistry (3,5)
7. Be familiar with major journals and publications pertaining to synthetic organic chemistry (3,5)
8. Organize and review chemical literature in a topic area and present in clear and concise written and oral format (3,4,10)

(*Numbers in parentheses indicate the departmental learning goals with which each course goal is aligned. See: [http://www.udel.edu/chem/goals.html](http://www.udel.edu/chem/goals.html).*)
Tentative Course Schedule:

W Feb 10. – PS1 Out
W Feb 17. – PS1 In, PS2 Out
W Feb 24. – PS2 In
W March 2. – EXAM 1, PS3 Out
W March 9. – PS3 In, PS4 Out
W March 16. – PS4 In, PS5 Out
W March 23. – PS5 In
March 28 – April 1 SPRING BREAK
W April 6. – EXAM 2, PS6 Out
W April 13. – PS6 In, PS7 Out
W April 20. – PS7 In, PS8 Out
W April 27. – PS8 In, Deadline to select Synthesis Proposal Molecule
W May 4. – EXAM 3
W May 11. – Synthesis Proposal Due
W May 16. Last Class Meeting
May 19-26 Final Exam Period

Final Exam – TBA