

Laboratory for Synthesis and Analysis of Organic Compounds

Course meetings: Section 1: Monday 12:30 -5:20 pm Bilger Addition 217
Section 2: Thursday 12:00 - 5:00 pm Bilger Addition 217

Teaching Assistants:

Monday: Cody Dickinson cfd4@hawaii.edu
Thursday: Duk Kim dukkim@hawaii.edu
Mon & Thurs: Ram Neupane neupane@hawaii.edu

Instructor: P. Williams philipwi@hawaii.edu
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Office hours by appointment.

Course Objective: The objective of Chemistry 445L is for students to develop a broader practical understanding of modern techniques and instrumentation used in a synthetic organic chemistry laboratory. CHEM 445L has WI classification, so expect to do a fair amount of writing, to have this writing critiqued and to revise your write-ups on the basis of that feedback before a final grade is assigned to your report. In keeping with the rules governing the assignment of the "WI" designation, the writing part of this course will earn you a significant portion of the final grade of the lab course. The purpose is to teach you to write technical reports accurately, concisely and to communicate your findings clearly. Shoddily produced documents, ridden with spelling and grammatical errors, will be returned without review (Note that scientific terms often are underlined in red by MS Word despite being spelt correctly).

Prerequisites: Chem 273 and Chem 273L; Declared Chemistry or Biochemistry Major

Corequisites: Chem 445

Grading:	Chemical Literature Report	70 points
	Chemical Characterization Report	70 points
	General Lab Techniques	200 points
	(TA Eval of Skills, % completion of synthesis, responsiveness to revision comments)	
	Synthesis Report # 1	20 points
	(Exp + NMR Analysis, No Discussion or Intro)	
	Synthesis Report # 2	60 points
	(Revised Syn 1, Exp 2: Exp+ NMR Analysis, Discussion Exp 1 & Exp 2)	
	Synthesis Report # 3	120 points
	(Syn 1, Revised Exp 2, Exp 3: Exp + NMR Analysis, Revised Discussion part 1-2, Discussion Part 3 Intro for Exp 1-4)	
	Final Synthesis Report	160 points
	(Synthesis Exp 1-4; all components)	

The synthesis report will be submitted in four parts that will eventually comprise the majority of final report. Feedback provided by TAs on each individual report should be incorporated into each subsequent draft, as a portion of points are allocated for the revisited content. The expectation is that the final report will incorporate all feedback and be conform with publications standards for an ACS journal. The first two reports and draft should each be a minimum of five pages long (12 point, double spaced, standard 1 inch margins) excluding figures and supplementary materials and attachments. All reports

should contain the fruits of your reading about the techniques used and by fully referenced. Failure to reference appropriately is plagiarism and will result in an automatic "F" in the course.

A final report on the multi-step synthesis should be at least about 10 pages long excluding supplementary materials and attachments. In this paper, you will document the characterization of the materials you have prepared and interpret the data to prove to me, the reader, that you have made the compounds you claim you made. The goal here is to be both succinct and comprehensive.

The remainder of the points (200 points) will be assessed based on:

- 1) level of preparation for the lab
- 2) effort and attitude (if you let you lab partner do all the work, expect a low grade!)
- 3) success in your laboratory work (yield, purity, number of times a reaction has to be repeated).
- 4) Responsiveness to feedback in written reports.

Writing Intensive: Attached to this syllabus is a "writing rubric" that will be used to evaluate the reports you will be submitting.

The general format for a full paper in Journal of Organic Chemistry is to be followed. A laboratory report has a brief *Introduction* into the problem you have been studying; a *Results* section in which you document your measurements and calculations; a *Discussion* section in which you document what you have learned from performing the experiment and place your results into the context of the background materials you have read; an *Experimental* section in which you describe how you performed the experiments in sufficient detail that somebody could reproduce your results. *Figures* are referenced in the text in order of appearance and figures have *Legends*, brief descriptions of what the figure is purported to show. Explain any symbols used. *Schemes* are similarly numbered in order of appearance in the text and have brief *Headers*, brief descriptions of what the scheme is about. *References* point the reader to material that you have consulted. References are numbered consecutively in the text. Use a consistent format: denote references by superscript numbers. In a separate reference section list these references. Please follow American Chemical Society format outlined in the ACS style guide (e.g., Clueless, I. M.; Knownot, I. M. *J. Irreproduc. Res.* **2009**, *10*, 176-178.)

Code of Conduct: Academic honesty policies can be found at the following website: <http://www.studentaffairs.manoa.hawaii.edu/policies/>. Students are expected to familiarize themselves with these rules. **Any student caught violating the policies on plagiarism or cheating will receive a grade of an "F" in the course.**

Disabilities: The University of Hawaii is an equal opportunity/affirmative action institution, dedicated to teaching all students and reaching all learners. It is our commitment to make our lectures and classrooms accessible to all students. If you have, or think you might have, a disability and have not voluntarily disclosed its nature and the support you need, you are invited to contact the UH KOKUA Program (<http://www.hawaii.edu/kokua/> or (808) 956-7511), or talk with the instructor in order to get any accommodation you might need to take the course. This information will be kept confidential. Please do this as early in the course as possible.

Section 1- Monday	Section 2- Thursday
9-Jan	12-Jan
Check-In & Safety Lecture	No Labs
16-Jan	19-Jan
Holiday: Jan 16th	Check-In & Safety Lecture
23-Jan	26-Jan
Chemical Literature Assignment	Chemical Literature Assignment
30-Jan	2-Feb
Synthesis	Synthesis
6-Feb	9-Feb
Synthesis	Synthesis
13-Feb	16-Feb
Synthesis	Synthesis
20-Feb	23-Feb
President's Day (Feb 20th)	Synthesis
27-Feb	2-Mar
Synthesis	Synthesis
6-Mar	9-Mar
Synthesis	Synthesis
13-Mar	16-Mar
Synthesis	Synthesis
20-Mar	23-Mar
Synthesis	Synthesis

27-Mar	30-Mar
Spring Break	Spring Break
3-Apr	6-Apr
Synthesis	Synthesis
10-Apr	13-Apr
Synthesis	Chemical Characterization
17-Apr	20-Apr
Chemical Characterization	Unknown Determination - Check Out
24-Apr	27-Apr
Unknown Determination - Check Out	