Advanced Organic Laboratory (Chem 373) – Spring 2011

This syllabus subject to change pending notification in class or via the email list

Instructor availability: Monday 1:10 – 4:00 pm, Tomsich 001

Prof. Yutan Getzler

Office:	Tomsich 308
Office hours:	Monday & Wednesday, 10 am to noon; Tuesday, 10 to 11 am.
PBX:	5304
email:	getzlery
website:	http://chemistry.kenyon.edu/faculty/getzler.htm

Required Texts:

J. Am. Chem. Soc., *Angew. Chem. Int. Ed., Tetrahedron, Science, etc…*

Potentially Useful Texts:

Zubrick – The Organic Chem Lab Survival Manual
Mayo, Pike & Trumper – Microscale Organic Laboratory

Required Material: bound laboratory notebook (no carbons), 1/2" three-ring binder (for spectra)

Point Distribution:

Percent purity & percent enantiomeric excess of epoxide	450
Notebook & spectra (as of 3/1/13)	50
Individual project: progress & demonstrated effort	250
Notebook, spectra & self-evaluation (as of 5/3/13)	250
Total	1000

Goals: The primary goal of this course is to foster independence in design and safe implementation of multi-step experimental procedures to achieve a stated objective. Supporting this are many other goals including meticulous recordkeeping in a laboratory notebook and of spectral data. New experimental techniques will be introduced including macro-scale synthesis and, perhaps, the handling of air-sensitive compounds. You will also need to be able to find relevant information using databases such as SciFinder and Science Citation Index. Once that information has been located, you will need to be comfortable accessing both electronic and print journal articles as well as their supplemental information sections.

Safety: This is a synthetic laboratory. In many of these experiments you will be working both on a larger scale and with more hazardous compounds then you have before. Thus you must always wear appropriate protective clothing. Safety glasses, long pants and shoes that cover the entire foot are required at all time. If I see you in the lab without any of these three items and the error goes uncorrected for , you will loose 5 points from your final score. To be fair, if you see me in the lab without any of these three items, I will add 10 points to your final score. I strongly recommend that you also wear gloves and a lab coat at all times. These items provide important temporary barriers which can and should be quickly removed when (not if) you accidentally spill a chemical. Another important aspect of safety is proper labeling. All flasks must be labeled with their contents in an unobscurable manner. Reactions must be labeled with a reaction ID tag. Finally, while you will often work outside of class time, you should ***never*** work in the lab by yourself – always make sure someone is in the lab with you.

Waste: Waste jugs must be labeled with the **full name** of the chemical and the approximate amount present. Abbreviations or chemical notation such as EtOH or CH_2Cl_2 are not acceptable.

Attendance: Attendance during the scheduled lab time is required. I will rarely if ever formally present material. However, during that time I will be available to answer your questions and assist you with technique.

Given this structure, I expect you to come to lab having thoroughly read the relevant material. You may need to read through it several times to begin to understand it. I expect you will have questions, and I will be more then happy to answer them. In fact, I encourage you to ask question during the week, prior to our formal meeting time. If you complete the epoxide synthesis early you may either start on your independent project or stop coming to class until after spring break.

Final Lab Cleanup: In lieu of a final exam, we will meet during finals week, at a time of your choosing, to do a final cleanup of the lab.

Laboratory Notebooks: You are required to purchase and maintain a laboratory notebook; if you have one from the previous semester with many remaining pages, you may use it. Your notebook should not be spiral bound or have carbons. Learning to keep an accurate and detailed lab notebook is critical as it is your only source of information to help you remember what you actually did in lab. While there is no single correct way to keep a lab notebook, you have all been through the Organic Lab course at Kenyon and know what is expected. Although it will only be graded twice during the semester, I **strongly** encourage you to check with me periodically regarding the style and quality of your notebook. *In the past, those who have not have suffered unpleasant surprises*. The most important rules are: 1) Your lab notebook is your scratch paper – observations, data and calculations* should be recorded directly into your notebook at the time the observations or measurements are made; 2) You should write with indelible ink; 3) After you are finished with your experiment, your lab notebook should contain sufficient information for another investigator, familiar with the field, to be able to reproduce your work, using only your notebook as a guide. Other useful references can be found in Zubrick, Chapter 2.

Spectra: For any given spectrum, write the compound index number (*e.g.* QED–1–010B) and structural formula clearly at the top. The method of sample preparation should also be clearly indicated (*i.e.* KBr pellet, Nujol mull, neat, CD_2Cl_2…). For IR, you need only indicate major bands (C=O, C-H, aromatic, CO_2, etc…). For NMR, ever peak must clearly be identified – this includes residual solvents (indicate which solvent), water, remaining starting material, etc. We will go over this with actual spectra from the class as they are taken.

Structure: The first half of the semester will involve a very specific project geared towards the synthesis and use of an important catalyst for the enantioselective kinetic resolution of terminal epoxides. I believe it likely that Jacobsen will win the Nobel Prize for this and related work he has done with enantioselective catalysis. In the second half of the semester you can choose from a variety of projects solicited from faculty in the department. These projects are derived from the faculty member's research, so any progress you make will contribute directly to ongoing and active scholarship. Information regarding these projects will be forthcoming and you are expected to plan for their execution during the first half of the semester.

Grading: The grade for epoxides purity and e.e. of the epoxides will be determined as follows: (percent purity of organic material/99)*(e.e./99)*450. Your performance will be evaluated over the entire semester based upon the following absolute scale: 97% --> A+; 93% --> A; 90% --> A-; 87% --> B+; 83% --> B; 80% --> B-; 77% --> C+; 73% --> C; 70% --> C-; 67% --> D+; 63% --> D; 60% --> D-; <60% --> F.

Academic Honesty: You are expected to follow the college policy for academic honesty (*Kenyon College Course of Study 2008-2009*; http://www.kenyon.edu/x11747.xml). All materials submitted for credit must be your own work.

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990: If you have a disability and need accommodation in order to fully participate in this class, please identify yourself to Erin Salva, Coordinator of Disability Services (PBX 5145, salvae@kenyon.edu).

* Simple calculations such as mmol or equivalents do not need to be shown.