

CHEM 238 Analytical/ORGANIC CHEMISTRY LAB

Syllabus

Course: Analytical/ORGANIC CHEMISTRY LAB CHEM 238-001

Department: Chemistry and Environmental Science
Tiernan Hall, Room 151
Tel: 973-596-3371

Scheduled: Tuesday 8:30am to 12:55pm

Term: Fall 2016

Instructor: Dr. Xinbo Lau

Office hours: By appointment

E-mail: xc37@njit.edu

Requirements:

CHEM 124 and CHEM 245 with a grade of C or better. This course will offer the CHE students experience in organic and analytical laboratory experiments. These experiments will reinforce concepts learned in the organic chemistry lecture classes. This laboratory course will also provide exposure to analytical and other techniques useful in the chemistry and chemical engineering laboratories.

Evaluation:

Attendance is mandatory. Labs cannot be made up and you cannot submit data you did not acquire yourself. Absence due to documented verifiable illness or emergency will be considered. However, missing 3 labs for *any* reason will result in automatic failure for this part of the course.

Grading

Attendance: 10%

Lab Report: 70%

Final Exam: 20%

Lab Report

Report is due one week after the whole lab at **the beginning** of the lab. Reports handed in later than the scheduled due date will lose 25% of available pts, 2 weeks after scheduled due date will lose 50% of available pts. If you are having difficulty writing up a lab, please make arrangements with the instructor.

Lab reports consist of: title, objective, introduction, procedure, results, discussion (analysis), conclusions, post lab questions reference, and Lab notebook.

SECTION	MAX SCORE
Objective / Purpose	10
Introduction / Theory	15
Chemicals and Apparatus	10
Procedures	10
Observations and Result	20
Conclusion	10
Post Lab Questions	10
Reference	5
Lab Notebook	10
TOTAL	100

The Laboratory Report

- Title:** Give the title of the experiment, your name, the date the report is submitted.
- Objective and purpose:** a) what is the objective of the experiment? b) What was measured and how was the data obtained?
- Introduction/ Theory:** Describe the nature and objective of the experimental investigation and the method(s) used. Give your account of the theory and concepts involved in the experiment.
- Chemicals and Apparatus:** List all the chemicals used in the experiment, and record the exact amount. Prepare a schematic diagram of the apparatus and identify components.
- Procedures:** Cite the reference that describes the details of the experimental procedure. Describe any procedure you used that differs from the cited reference. Specify the precision of the instruments used in the measurements. Identify and define all variables and constants. Specify the quantities that are measured and those that are calculated.

- f) **Observations/Results:** State the phenomena observed during the experiment. State the experimental measurements that were made, and what was calculated. Give the equations used for the calculations. Present the experimental data collected and the calculated results in tables and graphs where appropriate.
- g) **Conclusions:** What were the results and how do they compare with the literature? Provide approximately two or three concise sentences for each answer.
- h) **References:** List all the literature sources used to prepare the report.
- i) **Post Lab Questions:** answer the questions in details.
- j) **Lab notebook:** It is necessary to record what you do as you do it, so that your laboratory notebook is as accurate as possible. Edit your procedure as circumstances change, record your mistakes and places for potential error, and record your raw data as you work. Record your quantitative (numerical) or qualitative (descriptions or observations) data.

Be sure that the numerical value of every physical quantity has its appropriate units. Be sure that the number of significant figures reflects the precision of the measurement. State the range of uncertainty of any calculated result and how you determined that range.

You must:

- Know where the safety stations in the lab are.
- Know whether hoods are on.
- Know how to deal with burns.
- No drinking or eating in the lab.
- Safety glasses must have side shields and must be worn in the lab except in designated areas.
- Open toed shoes are not allowed.
- Do not wear contact lenses.
- Always wear gloves!

You must be in the class within 5 minutes of the starting time of the lab because safety instructions for the particular experiment are given then; otherwise you are absent.

SCHEDULE

Week 1	Check in.
Week 2	Safety Lecture. & Start Caffeine Expt: natural product extraction.
Week 3-4	Caffeine: distillation (evaporation), sublimation, TLC.
Week 5-6	Pinacolone reduction: reaction, extraction, distillation, IR.
Week 7-8	Pinacolyl alcohol dehydration: reaction, distillation, GC.
Week 9-10	Esterification: reaction, extraction, distillation, IR&NMR.
Week 11	Aldol: reaction, UV. (Crossed Aldol Condensation)
Week 12	Aspirin synthesis: reaction, extraction, recrystallization
Week 13	Exam /Check out