Ch 4B: Synthesis and Analysis of Organic and Inorganic Compounds
Ch 9: Chemical Synthesis and Characterization for Chemical Engineering

Spring 2020
Chemistry, California Institute of Technology

Course Instructor

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He, Him, His
Office hours : TBA

Teaching Assistants

Name	E-Mail	Name	E-Mail
Ally Stanko	astanko	Melinda Chan	tcchan
Robert Anderson	rlanders	Mike He	thhe
Lexie Beard	abeard	Nick Watkins	nbwatkin

Live-Online recitation hours TBA after class enrollment settles.

Course Description

Instruction in synthesis, separation, purification, and physical and spectroscopic characterization procedures of model organic and organometallic compounds, through video recorded experiments and downloadable data.
We will also be suggesting safe “at-home” versions of the experiments as extra credit.

Learning Outcomes

By the end of this course, students will be able to:

- Know basic safety practices for general laboratories
    - Identify safety hazards and offer solutions or alternatives to safety problems
- Write experimental procedure, and record experimental data & observations in a lab notebook as an experiment is being performed.
- Write a scientific article on an experiment that they performed or watched.
    - Use scientifically professional formats.
    - Cite appropriate references.
- Learn to use specific laboratory techniques
- Learn to perform and analyze specific spectroscopy methods

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Required Text

Organic Chemistry, Marc Loudon and Jim Parise (Chem 41 book, paper or pdf)

Course Learning Management System

Moodle (both 4B and 9)
https://courses.caltech.edu/course/view.php?id=3927
https://courses.caltech.edu/course/view.php?id=4126

Assessment Rubric

Approximate percentage breakdown. This may change as the TAs and Instructor alter the course to fit within the remote learning platform.

Assignment	Percentage
Safety Case Studies	10%
Notebook	20%
Assignments	15%
Unknowns	15%
Reports	40%
Total	100%

Attendance and Participation

Students must:
Watch all Lecture and Experimental videos.
Attend all online recitations with the TA.
Submit all notebooks, data assignments, unknowns, case studies, & reports.

Academic Integrity

Caltech's Honor Code: "No member of the Caltech community shall take unfair advantage of any other member of the Caltech community."

If there is a question as to if a line of actions is in violation of the honor code, you must ask the instructor their opinion.

Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit, and it violates the honor code in a fundamental way. You can find more information at: http://writing.caltech.edu/resources/plagiarism.

Collaboration Policy

Students taking Chem 3 are encouraged to discuss the problems and challenges they encounter in this course with other current students. Although collaboration is permitted, all written work: notebooks, and reports must be written on an individual basis. This means all work submitted must be in your own words, **no copying or paraphrasing** from other students, teaching assistants, lab manuals, or internet references. Lastly, do not refer to graded notebooks or reports from previous terms. Lab experiments and report requirements change from term to term and relying on previous material may end up hurting your grades more than helping them. If you feel you need further assistance in completing a written assignment, you should consult with the instructor or teaching assistants in this course.

Two of the primary goals of this course are to obtain optimal data and to help you learn to correctly interpret observations and results. You can acquire this ability more expeditiously if you confront any problems on your own, not by having someone else consistently do the analyses for you. If you have any questions regarding this policy, please see Dr. Mendez. He will be glad to consider and discuss any problems you have "honoring" it.

Course Schedule

We are working on a course schedule. Currently there will be 3 experimental projects each lasting multiple weeks. A schedule will be posted as soon as experiment 1 is finalized.

Current projects on the schedule are:

Synthesis and Analysis of acetyl acetone (acac), $Cr(acac)_3$ and $Co(acac)_3$;

Synthesis and Analysis of Ferrocene and Acetyl Ferrocene;

Synthesis and Analysis of Brooker's Merocyanine Dye, MOED.