CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA
CHM 424L, Organic Analysis Lab, Fall 2017

Lectures:	MW	12:00–12:50 pm	Room 9-277	Secn 01, CRN 72113
424L Lab:	MW	3:00–5:50 pm	Room 8-312	Secn 01, CRN 72114

Instructors: **Dr. Laurie S. Starkey** Room 4/1-428 Phone: (909) 869-3670
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Office Hours (Room 4-1-428) **Mon/Wed** 1-2 pm **Tue/Thu** 10:45-11:45 am (or by appointment)

Textbook & Materials:

Lab: Students must have GOGGLES, a LAB COAT, and a LABORATORY NOTEBOOK (alternating colored duplicate pages).

Prerequisites: One year of Organic Chemistry (lecture & lab), Quantitative Analysis (CHM 221/221L).

Goals of 424L: Students will learn to isolate, purify and characterize organic compounds, including the separation of mixtures, using modern methods and analytical techniques. After taking this course, students will be better prepared to work independently in an organic chemistry laboratory.

Learning Objectives for 424L Lab:

1. Obtaining samples of organic compounds (mixtures of unknowns will be provided as well)
    a. Isolation of natural products: liquids and solids
        i. e.g., essential oils, cholesterol, caffeine
    b. Synthesis of unknown products and/or product mixtures
2. Purification of organic compounds
    a. TLC and column chromatography
    b. Distillation (simple, fractional, steam, vacuum)
    c. Extraction (liquid-liquid, solid-liquid, acid-base)
    d. Recrystallization (isolation of salts)
3. Identifying organic compounds
    a. Melting point (solids), boiling point and refractive index (liquids)
    b. IR spectroscopy (sample preparation, running instrument, interpreting spectra)
    c. NMR spectroscopy (sample preparation, collect/process data, interpreting spectra)
    d. Mass spectrometry
    e. Preparation of derivatives

Grading of 424L Lab:

Students will be working in pairs but each student is responsible for turning in his/her own lab report. The lab report is due the beginning of the class meeting following the completion of each experiment (some activities will extend over more than one 3-hour lab meeting). Your notebook should be detailed enough that an experienced student should be able to reproduce the experiment without requiring any additional resources/notes. Course grades will be based upon an evaluation of the student's level of preparation and ability to safely conduct each experiment, prelab quizzes, lab reports, problem sets, projects and a final exam.

Academic Integrity: CHEATING WILL NOT BE TOLERATED. If any such situation is suspected, University policies will be strictly followed. While collaboration and teamwork are required and encouraged, each student is responsible for his or her own work: prelab, observations, discussion, etc.

California State Polytechnic University, Pomona
CHM 424L, Organic Analysis
Tentative Laboratory Schedule, Fall 2017

Week	**Monday** 9/25	**Wednesday** 9/27
1	Check-in, safety, notebook, demos: IR, NMR, TLC, make spotters	Diol oxidation
2	10/2 Quantitative NMR analysis of mixtures	10/4 Spearmint oil analysis (column chromatography)
3	10/9 "Whisky" distillation	10/11 "Whisky" continued Benzoic acid isolation from Listerine
4	10/16 Listerine, continued	10/18 Listerine, continued Caffeine extraction
5	10/23 Caffeine isolation/analysis	10/25 Ibuprofen isolation
6	10/30 Ibuprofen analysis Eugenol isolation from cloves	11/1 Eugenol continued
7	11/6 Isolation of essential oils from catnip (steam distillation)	11/8 Analysis of catnip cont'd
8	11/13 Separation of mixture by column chromatography, identification of unknowns	11/15 unknown analysis, continued
9	11/20 Alzheimer's drug isolation from flower bulbs	11/22 NO LAB (Alzheimer's drug NMR spectra analysis)
10	11/27 unknown analysis, continued	11/29 **CHECK-OUT &** **WRITTEN LAB FINAL/PROJECT**
F	12/4	12/6 *CHM 424 Lecture Final* *11:30 am – 1:30 pm*