

CHEM 3405-21A Instrumental Analysis LAB Spring 2023 (M 1:00 – 5:00 pm)

Instructor: Dr. J. SHAO

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Office Hours: 1:30 – 4:30 pm (TR) Or by appointment

[Teaching materials available on D2L](#)

Materials:

- Skoog, D. A.; Holler, F. J.; Crouch, S. R. *Principles of Instrumental Analysis*, 7th Ed., Thomas Brooks/Cole; **2018**
- Calculator with log functions and statistical functions
- Computer Access Including Microsoft Excel, and Internet Access
- *Approved Safety Goggles and Lab Coat* for wearing in lab

Prerequisites: Concurrent enrollment in CHEM 3405 Lecture

Grading Procedure:

8 Lab reports @ 100 pts each (drop 1)	700 (67.3 %)
8 Lab quizzes @ 20 pts each (drop 1)	140 (13.5 %)
Final paper test @ 200 pts	200 (19.2 %)

Attendance Policy: Attendance is expected as stated in the Student Handbook.

General Education Statement:

Students in this course must demonstrate their competency in written communication, some fundamental math skills, and basic use of computers through exams and written reports

Course Content:

This course provides laboratory experiments to accompany CHEM 3405 Lecture. Students will learn some basic methods in the lab which include GC and HPLC for the separation, AAS, AES, UV-visible and FT-IR for the spectroscopy and potentiometry and voltammetry for the electrochemistry.

Miscellaneous:

- Lab Starts on Time: Tardiness will not be tolerated.
- When and Where to Turn in Lab Reports: Turn in **carbon copy** pages of your lab reports on the following Monday when you come for the new lab. All later reports will be docked 25 points per day late.
- Safety First: Students not wearing lab coats and goggles and/or wearing open-toe shoes will not be accepted in the lab.

Laboratory Schedule:^a

Date	Experiment
<i>Jan. 16</i>	<i>Martin Luther King's Birthday, no class</i>
Jan. 23	Statistics Review, Basic GC Calculations, Calibrations & Check-in
Jan. 30 – Mar. 06	1. Determination of pK_a of acetic acid by potentiometric titration (1 week)
Jan. 30 – Mar. 06	2. Determination of the Composition of Gasoline by GC-FID (2 weeks)
Jan. 30 – Mar. 06	3. Determination of caffeine in soft drinks by HPLC (2 weeks)
Jan. 30 – Mar. 06	4. Determination of Iron in a Natural Water by UV-Visible (1 week)
<i>Mar. 13</i>	<i>Spring Break, No class</i>
Mar. 20 - Apr. 17	5. Determination of Na^+ in sports drinks by AAS and AES (2 weeks)
Mar. 20 - Apr. 17	6. Fluorometric Determination of Quinine (1 week)
Mar. 20 - Apr. 17	7. GC-MS of Citrus Oils (1 week)
Mar. 20 - Apr. 17	8. Cyclic Voltammetry (1 week)
Apr. 24	Check-out and final paper test

- a. All labs will be completed in team. But, **lab reports MSUT be finished independently**. The only things can be shared in each lab team are the experimental raw data.