

## CHEM 3405-21A Instrumental Analysis LAB Spring 2024 (M 1:00 – 5:00 pm)

**Instructor:** Dr. J. SHAO

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**Office Hours:** 1:00 – 4:00 pm (TW) Or by appointment

[Teaching materials available on D2L](#)

**Materials:**

- Skoog, D. A.; Holler, F. J.; Crouch, S. R. *Principles of Instrumental Analysis*, 7<sup>th</sup> 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 ( <b>drop 1</b> )	700 (67.3 %)
8 Lab quizzes @ 20 pts each ( <b>drop 1</b> )	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:<sup>a</sup>**

<b>Date</b>	<b>Experiment</b>
<i>Jan. 15</i>	<i>Martin Luther King's Birthday, no class</i>
Jan. 22	Statistics Review, Basic GC Calculations, Calibrations & Check-in
Jan. 29 – Mar. 04	<b>1.</b> Determination of $pK_a$ of acetic acid by potentiometric titration (1 week)
Jan. 29 – Mar. 04	<b>2.</b> Determination of the Composition of Gasoline by GC-FID (2 weeks)
Jan. 29 – Mar. 04	<b>3.</b> Determination of caffeine in soft drinks by HPLC (2 weeks)
Jan. 29 – Mar. 04	<b>4.</b> Determination of Iron in a Natural Water by UV-Visible (1 week)
<i>Mar. 11</i>	<i>Spring Break, No class</i>
Mar. 18 - Apr. 15	<b>5.</b> Determination of $Na^+$ in sports drinks by AAS and AES (2 weeks)
Mar. 18 - Apr. 15	<b>6.</b> Fluorometric Determination of Quinine (1 week)
Mar. 18 - Apr. 15	<b>7.</b> GC-MS of Citrus Oils (1 week)
Mar. 18 - Apr. 15	<b>8.</b> Cyclic Voltammetry (1 week)
<b>Apr. 22</b>	<b>Check-out and final paper test</b>

- 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.