

## **CHEM 3405 – Instrumental Analysis Lecture Spring 2024 (MWF 10:00 – 10:50 am)**

**Instructor:** Dr. J. SHAO

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**Office Hours:** 1:00 – 4:00 pm (TW)

**Textbook:** Skoog, D. A.; Holler, F. J.; Crouch, S. R. *Principles of Instrumental Analysis*, 7<sup>th</sup> Ed., Cengage Learning, **2018**.

**Prerequisites:** CHEM 3305 and concurrent enrollment of CHEM3405-21A

**Grading Procedure:**

4 One-hour Exams @ 100 pts each	400 (57.1%)
4 Pop Quizzes @ 25 pts each	100 (14.3%)
4 Paper Reviews @ 25 pts each	100 (14.3%)
Final ACS Test @ 100 pts	100 (14.3%)

**Grading Scale:**

Final grade will be given by the combination of lecture (60%) and lab (40%).  
Grade will be assigned as follows: **A:  $\geq 90\%$ ; B: 80 – 89%; C: 70 – 79%; D: 55 – 69% and F:  $< 55\%$ .**

**General Education Statement:**

Students in this course must demonstrate their competency in reading, writing, and some fundamental math skills through satisfactory completion of all assignments.

**Course Content:**

This course provides the basic knowledge of instrumental analysis. You will learn these techniques: Separation (GC, HPLC, SFC and CE), Spectroscopy (AAS, AES, UV-visible, FT-IR and MS) and electrochemistry (Potentiometry, Coulometry and Voltammetry). Four research papers related with four sections in this course will be assigned and reviewed by students using the knowledge learned in the course.

**Academic Dishonesty:**

Cheating on any exam, quiz or lab report will be regarded as academic dishonesty and will be subject to a final course grade of “F”.

**Tentative Lecture Schedule** (changes may be made)

<b>Date(s)</b>	<b>Chapter</b>	<b>Topic</b>
Jan. 17 – 19	26	An Introduction to Chromatographic Separations
Jan. 22	27	Gas Chromatography
Jan. 24 – 29	28	High-Performance Liquid Chromatography
Jan. 31 – Feb 02	30	Capillary Electrophoresis and Capillary Electrochromatography
<b>Feb. 05</b>	<b>TEST 1</b>	<b>Chapters 26 – 28, 30</b>
Feb. 07– 14	6	An Introduction to Spectrometric Methods
Feb. 16 – 21	7	Components of Optical Instruments
Feb. 23 – 26	8	An Introduction to Optical Atomic Spectrometry
Feb. 28 – Mar. 04	9	Atomic Absorption and Atomic Fluorescence Spectrometry
Mar. 06 – 08	10	Atomic Emission Spectrometry
<i>Mar. 11 – 15</i>	<i>No Class</i>	<i>Spring Break</i>
<b>Mar. 18</b>	<b>TEST 2</b>	<b>Chapters 6 - 10</b>
Mar. 20 – 22	13	An Introduction to UV-visible Molecular Absorption Spectrometry
Mar. 25 – 27	14	Applications of UV-visible Molecular Absorption Spectrometry
<i>Mar. 28 – 29</i>	<i>No Class</i>	<i>Easter Break Holiday</i>
Apr. 01 – 03	15	Molecular Luminescence
Apr. 05 – 08	16	An Introduction to Infrared Spectrometry
Apr. 10 – 12	17	Application of Infrared Spectrometry
<b>Apr. 15</b>	<b>TEST 3</b>	<b>Chapters 13, 14, 15, 16, 17</b>
Apr. 17 – 22	20	Molecular Mass Spectrometry
Apr. 24 – 26	22	Introduction to Electroanalytical Chemistry
Apr. 29 – May 01	23 - 25	Potentiometry, Coulometry and Voltammetry
<b>May 03</b>	<b>TEST 4</b>	<b>Chapters 20, 22-25</b>
<b>May 08</b>	<b>FINAL</b>	<b>10:30 am – 12:30 pm; Bolin-311</b>

Martin Luther King’s Birthday Observed.....	January 15, 2024
Classes begin.....	January 16, 2024
Change of Schedule or Late Registration.....	January 16-19, 2024
Deadline for May graduates to file for graduation.....	February 12, 2024
Spring break.....	March 11-15, 2024
Holiday break .....	March 28-29, 2024
Last day of drop for “W”, 4:00 pm .....	April 24, 2024
Last day of classes.....	May 03, 2024
Final examinations.....	May 06-09, 2024
Commencement.....	May 11, 2024

**Student Resources:**

[https://msutexas.edu/academics/scienceandmath/student\\_resources.php](https://msutexas.edu/academics/scienceandmath/student_resources.php)

**Campus-Carry Rules:**

*Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Area excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at <http://mwsu.edu/campus-carry/rules-policies>.*