



Department of Chemistry and Biochemistry

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Chemistry 3413: Principles of Instrumental Analysis
CUNY Queens College, Fall 2024

- Instructor** Dr. Jianbo Liu
Office Hours: Tuesdays 5:30 pm - 6:30 pm
Office Location: NSB B312
- Lectures** Tuesdays and Thursdays, 10:00 am – 11:15 am
Location: RE105
- Textbook** D. A. Skoog, F. J. Holler, and S. R. Crouch, *Principles of Instrumental Analysis*, 7th ed., Thomson Brooks/Cole, 2018. (Required)
PowerPoint slides are available
<https://www.qc.cuny.edu/academics/chem/jianbo-liu-teaching-materials/>
- Grading** Randomly scheduled quizzes and Homework – 30%
Three in-class exams – 40%
Final exam – 30%

Lecture Schedule

| Date | Meeting No. and Topics |
|--------|-------------------------------------------------------------------|
| Aug 29 | 1) Introduction to Instrumental Analysis (chapter 1) |
| Sep 3 | 2) Signals and Noise (chapter 5) |
| Sep 5 | 3) Introduction to Spectroscopy (chapter 6) |
| Sep 10 | 4) Components of Optical Instruments (chapter 7) |
| Sep 12 | 5) Molecular Spectroscopy: UV-Visible Spectroscopy (chapter 13) |
| Sep 17 | 6) Molecular Spectroscopy: UV-Visible Spectroscopy (chapter 14) |
| Sep 19 | 7) Molecular Spectroscopy: Luminescence Spectroscopy (chapter 15) |
| Sep 24 | 8) Molecular Spectroscopy: Luminescence Spectroscopy (chapter 15) |
| Sep 26 | 9) Exam I |
| Oct 1 | 10) Molecular Spectroscopy: Infrared Spectroscopy (chapter 16) |
| Oct 3 | No class scheduled |
| Oct 8 | 11) Molecular Spectroscopy: Infrared Spectroscopy (chapter 17) |
| Oct 10 | 12) Molecular Spectroscopy: Raman Spectroscopy (chapter 18) |
| Oct 15 | Monday Schedule |
| Oct 17 | 13) Molecular Spectroscopy: Raman Spectroscopy (chapter 18) |
| Oct 22 | 14) Mass Spectrometry (chapter 11) |
| Oct 24 | 15) Mass Spectrometry (chapter 20) |
| Oct 29 | 16) Applications of mass spectrometry |
| Oct 31 | 17) Mass spectrometry lab tour (SB D333) |
| Nov 5 | 18) Exam II |
| Nov 7 | 19) Introduction to Separation Science 1 (chapter 26) |
| Nov 12 | 20) Introduction to Separation Science 2 (chapter 26) |
| Nov 14 | 21) Gas Chromatography (chapter 27) |
| Nov 19 | 22) High Performance Liquid Chromatography (chapter 28) |
| Nov 21 | 23) High Performance Liquid Chromatography (chapter 28) |
| Nov 26 | 24) Introduction to Electroanalytical Chemistry (chapter 22) |
| Nov 28 | Thanksgiving |
| Dec 3 | 25) Potentiometer (chapter 23) |
| Dec 5 | 26) Voltammetry (chapter 25) |
| Dec 10 | 27) Exam III |
| Dec 12 | 28) Review |
| | Final Exam |

Exam Information:

All exams are closed book/notes and no additional material can be consulted other than that provided with the exam sheet.

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|------------|-------------------|--------------------------------|
| Exam I | Chapters covered: | 1, 5-7, 13-15 |
| Exam II | Chapters covered: | 16-18, 11, 20 |
| Exam III | Chapters covered: | 26-28, 22, 23, 25 |
| Final Exam | | the entire semester's material |