

CHEMISTRY 313/413

ADVANCED INSTRUMENTAL DESIGN
FALL SEMESTER 2005



Instructor Information

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Course Objective

This course covers method development for the analysis of complex organic mixtures. The analytical techniques detailed are High Performance Liquid Chromatography (HPLC), Gas Liquid Chromatography (GLC), and other appropriate methodologies. This course will also cover an in depth analysis of the validation of analytical methods and integrate the techniques that are learned with practical applications.

September 1	Introduction/Laboratory Assignment
September 8	HPLC Instrument – Overview of Instrument Modules
September 15	HPLC Instrument (Con't)
September 22	Introduction to Analytical Separations and Terms
September 29	Method Development – Where to Begin (Quiz)
October 6	Method Development – Solvent Optimization
October 13	Test 1
October 20	Temperature, Flow Rate, and pH
October 27	pH (con't) and Mobile Phase Additives
November 3	HPLC Columns and Method Validation (Quiz)
November 10	Detectors and LC-MS
November 17	Test 2
November 22	GC/GC-MS
December 1	Alternative Chromatographic Techniques/Current Topics
December 15	FINAL EXAMINATION

Midterm and Final examinations will be given on the specified dates. There will be no makeup exams.

Course Grading

Test 1	20%
Test 2	20%
Final	25%
Quizzes	10%
Laboratory Assignment	25%

Course Times and Location

Chemistry 313/413 lectures will be held every Thursday from 5:10 – 7PM. There are two laboratory sections that will meet on Tuesday from 5:10 – 8PM and Thursday from 7:10 – 10PM.

Required Texts

There is not a designated textbook for the course. Listed below are several texts that can be used as reference material that will help you follow the material presented in the lecture, i.e., a more in-depth description of the subject matter presented in class. In addition, journal articles will be provided to the students that will correlate with the lecture material. The journal articles are also the primary source for questions that will be presented in the short quizzes. Student are required to read the journal articles, which then will be discussed in class prior to the quiz.

Class Attendance

Regular attendance is expected but not required for the lecture. However, makeup tests and quizzes will not be given if a student is absent when they are scheduled. Exceptions will be considered if the student informs the instructor prior to the test and/or quiz and provides the instructor with proper documentation from a physician or other agency explaining the reason for their absence. **Students are required to attend the laboratory sessions.** Exceptions will be considered if the proper notification and documentation is provided explaining the reason why they were unable to attend the lab. The teaching assistant will record the student's attendance for every laboratory session. A full letter grade will be deducted from the student's final laboratory grade for every unexcused absence.

Office Hours

I will conduct office hours every Thursday following the lecture for as long as needed. In addition, the students can contact me any time outside of the regular scheduled office hours via telephone and e-mail.

Disability Disclosure Statement

Any student who has a need for accommodation based on the impact of disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.

Texts for Reference on HPLC Theory and Application

1. Practical HPLC Method Development

Lloyd R. Snyder, Joseph L. Glajch, Joseph J. Kirkland,
With Joseph Kirkland, With Joseph Glajch

2. Liquid Chromatography Detectors

Thomas M. Vickrey

3. Handbook of Modern Pharmaceutical Analysis

Satinder Ahuja (Editor), Stephen Scypinski (Editor)

4. HPLC Columns: Theory, Technology, and Practice

Uwe D. Neue, M. Zoubair, El Fallah

5. Practical HPLC Methodology and Applications

Brian A. Bidlingmeyer