

CHEM 5318 / 6318
Advanced Analytical Chemistry
(Advanced Instrumental Analysis)
Spring 2016
11:00 am - 12:50 PM TR
PSC 403



Instructor: XiuJun (James) Li, Ph.D.

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Office hours: by appointment

References:

- Principles of Instrumental Analysis, 6th edition, by Skoog (ISBN: 9780495012016)
- Microfluidic Devices for Biomedical Applications, by Li (ISBN: 9780857096975)

Brief Course Description:

- This course presents multidisciplinary instrumental analysis techniques for bioanalysis, environmental analysis and material characterization. While focusing on advanced instrumental analysis techniques (e.g. capillary electrophoresis and microfluidic lab-on-a-chip), it will also cover fundamentals of advanced analytical chemistry (e.g. quality assurance), various detection methods (e.g. laser-induced fluorescence and electrochemical detection). From this course, the student will learn the fundamentals of advanced instrumental analysis techniques and their application in chemistry, life science, material science, and bioengineering.

Objectives:

- To learn contemporary instrumental analysis techniques.
- To develop research abilities to propose new solutions to solve problems using modern analytical chemistry techniques.
- To develop interdisciplinary research abilities.
- To become conversant with recent research advances in analytical chemistry.

Contents:

- Introduction of advanced analytical chemistry
- Fundamentals of advanced analytical chemistry
 - Calibration methods
 - Quality assurance...
- Electroanalytical Chemistry:
 - Fundamentals
 - Voltammetry

- Laser-induced Fluorescence
- Separation Science
 - Fundamentals
 - Capillary Electrophoresis (CE) separation
 - Detectors
- Miniaturized microfluidic Lab-on-a-chip
 - Microfabrication
 - Microchip CE separation
 - Application
- Nanosensors
- Surface characterization
 - XPS...

Evaluations:

Exams: 40% (in-class quizzes and exams; No makeup exam.)
 Presentation: 25 %
 Research paper: 25 %
 Attendance and Class Participation: 10 %

Grades:

A: 90% - 100%, B: 80% - 89%, C: 70%-79%, D: 60%-69%, F: <60%

Academic honesty:

Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Violations will be taken seriously and will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.

Students with Disabilities

If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Office of disabled Student Services located in Union E Room 203. Students who have been designated as disabled must reactivate their standing with the Office of Disabled Student Services on a yearly basis. Failure to report to this office will place a student on the inactive list and nullify benefits received. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of Disabled Student Services. You may call 747-5148 for general information about the Americans with Disabilities Act (ADA).

Syllabus is subject to change. Any changes will be announced in class, by email, and posted on the course Blackboard site during the semester. You are solely responsible for getting the most updated information.