

Tentative Syllabus

Chromatography, Chemistry 543

Spring 2006

Instructor: Alena Kubatova, Abbott Hall (301), 777-0348

Lecture: MWF 10:00-10:50 Ah 115

Office hours: W 11:00-12:00 Ah 301

Required Text: Chromatography, Concepts and Contrasts, 2nd Ed Wiley-Interscience, 2005, ISBN 0-471-47207-7

This course will cover separation methods that are currently applied in industrial as well as research laboratories. Although this course is a graduate level, fundamentals will be reviewed. However, I will expect students to be familiar with those topics and thus quick in understanding of quantitative chemistry.

To enhance interaction and active learning there will be special assignments within this class including two article presentations. Since the analytical chemistry is a practical science requiring hands on experience, there will also be lab assignments, in which students will individually perform practical measurements and demonstrate their understanding on applied examples.

Components	No.	Points each	Total Points
Article presentations	2	50	100
Presentation evaluating quizzes		2	~40
Lab assignments	2	50	100
Final Exam	1	150	150
Total			~390

Reading Material

Fundamental concepts of chromatography	Chapter 2
Achieving optimal separation - rate theory	Chapter 3
Gas Chromatography (GC)	Chapter 7
Liquid Chromatography (LC)	Chapter 8
Quantitation & Detectors	Chapter 9
Hyphenated techniques GC/MS, LC/MS	Chapter 10
Sample preparation - extraction	Chapter 14
Applications	

Presentations

Students are expected to sign up and present two 10-20 min PowerPoint presentations. One topic will be selected and offered by the instructor. For topics, see assignment section on the blackboard. The second presentation should cover some practical application on LC, GC or extraction; the topic will be selected by student from per reviewed journal or LC/GC North America, and approved by the instructor. The electronic version should be submitted to the instructor by 9 am on the date presented.

The signup for the first and second presentation is January 20th, February 20th, 2006, respectively. The date of the presentation will be selected with respect to the lecture material. Failure to signup and present within specified dates will result in loss of points.

Evaluation of presentation

Presentation should include:

- reference to the paper presented
- the reason for presentation
- problem/material discussed in the article
- basics of analytical methods used
- factors affecting those methods
- conclusive optimal conditions – their advantages and disadvantages
- critical evaluation of the method by student

The presentation should be presented in a clear comprehensive manner so other students can learn from it. The questions regarding the presentation may appear on final exam. Each student should show understanding of the material covered. Students need to deliver Power presentation to instructor. The presentation will be posted on the blackboard in the form of PDF file. The presentation will be followed by the 5-10 min discussion, and 5-min 2-point quiz question.

- 1) What did you learn in this presentation? Explain in 2-3 sentences.

Supporting literature

- A practical guide to the care, maintenance, and troubleshooting of capillary gas chromatographic systems by Dead Rod, Huthig, ISBN 3-7785-1898-4
- Practical HPLC method development by L.R. Snyder, J.J. Kirkland, J.L. Glajch, Wiley Interscience, ISBN 0-471-00703-X
- Modern Practice of Gas Chromatography R.L. Grob, E.F. Barry, Wiley Interscience, ISBN 0417-22983-0
- Sampling and sample preparation for field and laboratory, ed. J. Pawliszyn, Comprehensive Analytical Chemistry ed. D. Barcelo, Elsevier, ISBN: 0-444-50511-3

Web site links/demos

LC GC North America <http://www.lcgcmag.com/lcgc/>

Agilent

E-seminars

<http://www.chem.agilent.com/scripts/generic.asp?IPage=12580&indcol=N&prodcol=N>

GC troubleshooting <http://www.chem.agilent.com/cag/cabu/gcreflib.htm>

LC troubleshooting <http://www.chem.agilent.com/cag/cabu/lcref.htm>

Separation Methods in per Reviewed Journals

Journal of Chromatography A

Journal of Chromatography B

Journal of Separation Science
Journal Analytical and Bioanalytical Chemistry
Journal of Chromatographic Science
Chromatographia
Electrophoresis
Trends in Analytical Chemistry
Journal of Liquid Chromatography and Related Techniques
Journal of Supercritical Fluids