

A314: Methods for Biological and Environmental Chemical Analysis Spring 2009

Instructor: Dr. Jill Robinson
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Office hours: M (10-11 AM), W (11-12 AM) or by appointment
Course Homepage: <http://www.chem.indiana.edu>

Lectures:
M,W 9:05-9:55 in CH001

Goal: A314 is a 2 credit hour lecture course designed to teach the basic principles of modern analytical chemistry and instrumentation. This course should be taken with the complementary lab course A316 which provides practical training in quantitative laboratory skills and state of the art instrumentation. A particular emphasis will be placed on scientific writing and analysis of samples of biological origin.

Required Materials:

Textbook: Harris, Daniel, C. Quantitative Chemical Analysis, 7th Ed., W.H. Freeman and Company, 2007.
Lab Notebook: Permanently Bound
Laboratory Manual: Experiments can be printed from the course website.
Safety Goggles

Grading:

<u>Lecture</u>	
Exam 1	150 pts.
Exam 2	150 pts.
Exam 3	150 pts.
Final Exam	150 pts.
Homework (8 @15 pts. each)	120 pts.
No late homework is accepted	
In class group work	50 pts.
Total	770 pts.

Tentative Lecture Schedule

Note: Friday lab lecture is for student enrolled in A316.

Date	Lecture Topic	A316 Laboratory Experiment
M 1/12 W 1/14 F 1/16	What is Analytical Chemistry? Units, Measurements, and Error Lab Lecture: Statistical Analysis of Data	Journal Style Lab Report Assignment
M 1/19 W 1/21 F 1/23	MLK Holiday Fundamentals of Spectrophotometry (Ch. 18) Lab Lecture: Protein Assay	Statistical Analysis of Data Assignment
M 1/26 W 1/28 F 1/30	Fundamentals of Spectrophotometry (Ch. 18) Spectrophotometers (Ch. 20) Lab Lecture: Detection Limits	Comparison of Two Protein Assays
M 2/2 W 2/4 Th 2/5 F 2/6	Spectrophotometers (Ch. 20) Spectrophotometers (Ch. 20) Exam 1 from 7-9 PM Lab Lecture: Fluorescence Anisotropy	Detection Limits of Abs./Fluor. Instruments
M 2/9 W 2/11 F 2/13	Atomic Spectroscopy (Ch. 21) Atomic Spectroscopy (Ch 21) Lab lecture: Atomic Absorption	Fluorescence Anisotropy (Binding of Flavenoid to Protein)
M 2/16 W 2/18 F 2/20	Atomic Spectroscopy (Ch. 21) Atomic Spectroscopy (Ch 21) Lab lecture: Immunoassays	Atomic Absorption Analysis
M 2/23 W 2/25 F 2/27	Ch. 23 Intro to Analytical Separations Ch. 23 Intro to Analytical Separations Lab lecture: GC-MS	ELISA Analysis of Triazine Herbicides in Ground Water
M 3/2 W 3/4 Th 3/5 F 3/6	Ch. 23 Intro to Analytical Separations Ch. 24 GC Exam 2 from 7-9 PM Lab lecture: HPLC	GC-MS Analysis of Triazine Herbicides in Ground Water
M 3/9 W 3/11 F 3/13	Ch. 24 GC Ch. 25 LC Lab lecture: CE	Amino Acid Composition of a Protein by HPLC
M 3/16 W 3/18 F 3/20	Spring Break	Spring Break
M 3/23 W 3/25 F 3/27	Ch. 25 LC Ch. 26 Chromatographic Methods Lab lecture: Proteomics SDS-PAGE	CE Analysis of an Analgesic Tablet
M 3/30 W 4/1 F 4/3	Ch. 26 Chromatographic Methods Ch. 26 CE Lab lecture: Proteomics Tryptic Digestion	Proteomics Week 1: SDS PAGE, Gel Staining
M 4/6 W 4/8 Th 4/9 F 4/10	Ch. 26 CE Ch. 22 Mass Spectrometry Exam 3 from 7-9 PM Lab Lecture: MALDI-TOF	Proteomics Week 2: Gel Imaging, Spot Excision, Tryptic Digestion
M 4/13 W 4/15 F 4/17	Ch. 22 Mass Spectrometry Ch. 22 Mass Spectrometry Lab lecture: Data base mining	Proteomics Week 3: MALDI-TOF Data Acquisition

M 4/20	Biological Mass Spectrometry	Proteomics Week 4: Data base mining and Identification of Proteins
W 4/22	Biological Mass Spectrometry	
F 4/24	Lab lecture: course evals	
M 4/27	FTIR (Ch. 20)	Writing evaluation
W 4/29	FTIR (Ch. 20)	
F 5/1	Lab lecture: no class	
M 5/4	Final Exam 10:15-12:15 AM	