

Syllabus - Chemistry 335 - Fall 2009

Chemical and Biochemical Analysis (Lecture and Laboratory)

Prerequisites: Chemistry 116/117 or CHE 119/139

Lecture Time and Place: Tuesday and Thursday, 11:00-12:20 PM 105 Life Sciences

Lab Time and Place: Tuesday and Thursday, 12:30-3:20 PM 201 Life Sciences

Faculty Instructor: Prof. Mark Braiman (Lab 0-028 CST; 443-4701; mbraiman@syr.edu)

Teaching Assistant: TBA

Office Hours: Welcome any time you find me in my office or lab; appointments are available by email, phone or before/after class

Text: *The Art and Science of Chemical Analysis* (Christie G. Enke, Wiley, 2001). Numbers in parentheses below refer to chapters in Enke textbook.

Web Access After Registration: <https://blackboard.syr.edu/webapps/login/>

Class Schedule of Lectures

Tuesday	Topic	Thursday	Topic
Sept 1	Elements of Measure (2)	Sept 3	Acidity/Activity/pH (3)
Sept 8	Acidity/Activity/pH (3)	Sept 10	Analysis of Acid/Base Reactivity (4)
Sep 15	Analysis of Acid/Base Reactivity (4)	Sep 17	Analysis by Absorption of Light (5)
Sep 22	Analysis by Absorption of Light (5)	Sep 24	Analysis by Photon Emission (6)
Sep 29	Analysis by Photon Emission (6)	Oct 1	<i>Review Chapters 2-5</i>
Oct 6	<i>Hour Exam Chapters 2-5</i>	Oct 8	<i>Return Hour exams and review</i>
Oct 13	Analysis by Complexation (7)	Oct 15	Analysis by Complexation (7)
Oct 20	Analysis by Precipitation (8)	Oct 22	Analysis by Precipitation (8)
Oct 27	Analysis by Electrode Potential (9)	Oct 29	Analysis by Electrode Potential (9)
Nov 3	Analysis by Redox Reactivity (10)	Nov 5	Analysis by Redox Reactivity (10)
Nov 10	Analysis by Interphase Partition (11)	Nov 12	Analysis by Interphase Partition (11)
Nov 17	<i>Review Chapters 6-10</i>	Nov 19	<i>Hour Exam Chapters 6-10</i>
Nov 24	<i>Return Hour exams and review</i>	Nov 26	<i>No Class, Thanksgiving Break</i>
Dec 1	Analysis by Biochemical Activity (12)	Dec 3	Analysis by Biochemical Activity (12)
Dec 8	Return Hour Exam and Review	Dec 10	<i>Review Entire Course</i>
<i>Cumulative Final Exam: TBA</i>			

Lecture Grading: 100 points for each Hour Exam (200 points), 40 points for Homework Problem Sets, and 160 points for the Final Exam for a total of 400 points.

Schedule of Laboratory Experiments

Lab Date	Topic
Sept 1	<i>No Lab (First day of Class)</i>
Sept 8	1. Error Analysis, Pipetting, and Quantification of DNA and Protein by UV
Sep 15	2. Determination of Chloride: Onondaga Lake, Jamesville Reservoir & Sea Water
Sep 22	3. Determination of Replaceable Protons by Direct Titration
Sep 29	4. Spectrophotometric Determination of Iron in Vitamin Tablets
Oct 6	<i>No Lab (Exam Day)</i>
Oct 14	5. Determination of Xylenes in Gasoline by FTIR Spectroscopy
Oct 20	6. Determination of Calcium in Onondaga Lake, Jamesville Reservoir and Sea Water
Oct 27	7. Protein Unfolding Monitored by Fluorescence
Nov 3	8. Percent Ethanol in Water Determination by Raman Spectroscopy
Nov 10	9. Separation of Amino Acids by Thin Layer Chromatography
Nov 17	10a. Spectrophotometric Analysis of Primary Amines in Proteins, part 1
Nov 24	<i>No Lab (Thanksgiving week)</i>
Dec 1	10b. Spectrophotometric Analysis of Primary Amines in Proteins, part 2
Dec 8	<i>No Lab (Makeup week)</i>

Notes:

1. A short in-lab lecture on the principles, techniques and rationale underlying each experiment will be provided just prior to the experiment.
2. Sign-ups for Experiments 6 through 10 will be required to access the needed instrumentation.

Lab Grading: 40 points per lab experiment for a total of 400 points

Final Grade: A single grade will be given for the 4-credit course. It will be based equally on the lecture and laboratory portions of the course. Grades will be distributed on a curve out of a total possible 800 points.

Academic Integrity for Lecture and Laboratory

Compliance with **Section 1.0.1 Academic Integrity Expectations** of the *Syracuse University Undergraduate Catalog* is required.

- Students may work together on all homework assignments.
- Students may work with partners in carrying out laboratory experiments, but only to the extent directed by the teaching assistant during each individual experiment.
- All submitted writings, calculations, and/or graphical work that counts towards the grade must be the creation of individual students, and not the result of a partnership or group effort.
- In particular, no student may receive help from any other student during in-class written examinations.
- Additionally, assistance in writing laboratory reports from anyone else (other students; faculty; or family members) that extends beyond critiquing and correction, e.g. of minor typographical or mathematical errors, is prohibited without advance email permission from the instructor.
- Each lab report may have at most ~5% of its text, data, and figures taken from previously-published work (or from previously-submitted assignments by the same student); but only if the original material is cited clearly, and is available to the instructor, TAs, and/or graders without cost from Syracuse University libraries, or from free or SU-library-licensed websites; or (if it is

the student's prior work) it is photocopied and included with the lab report. Anything beyond these limits will be considered unacceptable plagiarism.

Disability-Related Accommodations

If you believe that you need accommodations for a disability, please contact the Office of Disability Services(ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

- Syracuse University and I are committed to your success and to supporting Section 504 of the Rehabilitation Act of 1973. This means that in general no individual who is otherwise qualified shall be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity, solely by reason of having a disability.
- You are also welcome to contact me privately to discuss your academic needs, although my direct participation in designing any disability-related accommodations will generally be limited to those that would require my special expertise in chemistry-- for example, in re-designing any of the course's laboratory procedures as needed to accommodate a physical disability.