

Chemistry M3LC Syllabus -- Fall 2017
Department of Chemistry, UC-Irvine
Website: <http://unicorn.ps.uci.edu/M3LC>

Version Date: 9/14/17

Lectures: Mon and Wed at 12:00 pm - 12:50 pm in Rm. MSTB 118.

Lecture Instructor:
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Introduction

Chemical analysis has become a part of everyday life in America. Rarely a day passes without an environmental, biochemical or toxicological problem that is defined in terms of chemical composition and measurement. Arsenic contamination of groundwaters in Bangladesh, carbon dioxide measurements in the atmosphere, the detection of minute concentrations of cancer biomarkers, trace analysis for the identification of weapons materials in airports, the radiochemical analysis of nuclear cleanup sites -- all of these politically potent subjects require the use of chemical analysis to help define the issues. In this course we will learn how to apply the concepts of chemical reactivity and equilibrium from Freshman Chemistry in a quantitative fashion to the field of chemical analysis. We will also be introduced to the measurement techniques of optical spectroscopy, electrochemistry and chromatography. Through a series of weekly lectures and laboratory projects, we will learn how to design and implement a well-defined chemical analysis that conveys the results with full scientific validity and import.

Textbook:
Fundamentals of Analytical Chemistry, 9th ed.
D. A. Skoog, D. M. West and F. J. Holler and S. R. Crouch.
Hardcover: 1072 pages
Publisher: Brooks Cole; 9 edition (January 1, 2013)
ISBN-10: 0495558281
ISBN-13: 978-0495558286

There is a 7th and an 8th edition of this book as well. You are welcome to use an earlier edition and save a lot of money! Earlier editions have the same content, but sometimes the subject order is switched a little bit. I will put a copy of the table of contents of the eighth edition on the class website in the Handouts section.

Course Structure:

I. Weekly Laboratory Experiments

Each week there will be a 4-hour Laboratory –the class is broken in to smaller lab sections with Lab TAs. The following is a schedule of the weekly Laboratory experiments. Please see the website for detailed descriptions of each laboratory.

Week 1:

Glassware/Safety/Computers/Error Analysis

Week 2:

Quantitative Spectroscopy, Part I: Fe Colorimetry

Week 3:

Quantitative Spectroscopy, Part II: Fluorescence Spectroscopy

Week 4:

Acids and Bases: Titrations and Buffers

Week 5:

Electrochemistry Part I: Measuring Current and Voltage

Week 6:

Electrochemistry, Part II: Potentiometry, Potentiometric Titrations, Solubility Equilibria

Week 7:

Complexation Reactions and EDTA Titrations

Weeks 8 & 9:

Seawater Analysis

II. Weekly Lectures:

Prof. Corn will be in charge of the Weekly Lectures for the course. Each week there will be two 50 minute lecture sessions on Mon and Wed at 12:00p - 12:50p in Rm MSTB 118. These sessions will include instructions from the head TAs on the weekly laboratory experiment. The purpose of the lectures is (in general) to acquaint you with the stoichiometric and physicochemical underpinnings of chemical analysis, and (more specifically) to give you concrete examples of the types of calculations you will need to analyze your laboratory data. Each week Prof. Corn will lecture on all subject relevant to the Laboratory Experiment of the week, and provide examples of the types of calculations you will need to analyze your laboratory data. Additionally, any analytical chemistry subjects incorporated into Chem M3C will also be discussed.

III. Online and Other Problem Sets

Each week there will be a set of problems on Sapling for you to get more practice with the quantitative analysis calculations. Sapling is also where you will find the pre-lab. Pre-lab work must be completed before your assigned lab time. TAs may request that a students leave lab if they have not completed the assigned pre-lab work. There will also be three or four additional problem sets that may require the use of spreadsheets.

IV. Laboratory Reports

Your grade in the laboratory component of this class will be determined primarily by your laboratory reports. Please see our handout on lab report format and grading policies that is posted on the website: <http://unicorn.ps.uci.edu/M3LC/handouts/>

Grading

Your grade in this course will have three components:

800 Points – Laboratory Reports -- please see the lab policies web handout for details

200 Points – Online Homework and Other Problem Sets

If you score the following percentages of points in the class, you are guaranteed a minimum of the following grades:

A+: discretionary	A: 90%+	A-: 88-89	B+: 86-87	B: 80-85
B-: 78-79	C+: 76-77	C: 70-75	C-: 68-69	D+: 66-67
D: 60-65				

If necessary, we will adjust the final grades so that the average is at least a B-. But it's typically higher, and there is nothing stopping everyone from getting A's!

Additional Notes and Policies:

Laboratory Safety

Safety in the Laboratory is our highest priority. Please see our detailed handout on the mandatory lab safety rules and procedures in the document posted on the website: <http://unicorn.ps.uci.edu/M3LC/handouts/safetyprocedures.pdf>.

Attendance

Attendance of lab sections is required; attendance of Prof. Corn's lectures are highly recommended as the topics will help you understand the various laboratory experiments.

E-mailing your Instructor and TAs

Please use common courtesy when sending emails to the TAs or to me. Your emails should always include a subject line, student name, and student UCI ID number; and deal with questions that are directly related to the course material (please check the website first for an answer to your question). Email requests for report deadline extensions will not be honored, and requests for regrading in order to achieve incremental score increases will result in an extremely thorough re-evaluation of the report with no guarantee that the score will either go up or down. We will do our level best to respond to all relevant email questions as soon as possible.

Cheating

Cheating and plagiarism will not be tolerated and will be immediately rewarded with an "F". Please inspect the university policies on academic dishonesty for more details as well as the specific policies for this course. Examples include: is copying sections of your lab report from a book, another student's lab report, manuscript, on-line source, etc. Please do not jeopardize your future careers by being irresponsible. For more information, please see the lab report policies handout and for the University rules: <http://www.editor.uci.edu/catalogue/appx/appx.2.htm>

Adds/Drops/Changes

Use WebReg to add or drop your classes. Additions: Students may not add to M3LC/H2LC after the first lab has passed. Drops: The deadline to drop courses in the Department of Chemistry is the end of Week 2 by 5:00PM. Drops can be made in WebReg. For all enrollment questions, please see the staff in the Chemistry Undergraduate Office in NS2 1101.