

# Chemistry 103Lxg Spring 2013

## General Chemistry for the Environment and Life

Course Homepage: TBA

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<b>Teaching Assistants</b>	Tu/Th 12pm-2pm (tentative)
	TBA

**Lectures:** 2:00pm-3:20 pm Tuesday and Thursday in SSL 150  
**Laboratory:** 9:00am-11:50am Thursday or 4:00pm-6:30pm Thursday in SGM 117

**Overview:** Welcome to CHEM 103. This is a one semester, rigorous introductory chemistry lecture and laboratory course that covers important aspects of general, organic and biological chemistry (GOB). While the text and outline is similar to GOB introductory courses taught at other universities, this course is tailored more specifically to Environmental Studies, Neuroscience, and other life science studies at USC. This course is not appropriate for medical school preparation and will not serve as a prerequisite for the organic chemistry course sequence. Students majoring in chemistry, other natural sciences, or engineering will normally register in the CHEM 105ab sequence. Consult your advisor and the instructor immediately if you have questions about CHEM 103 vs. CHEM 105ab.

Environmental Studies and Neuroscience are interdisciplinary fields in which students are required to have a mastery of elements of several traditional disciplines in addition to content and methods specific to their own fields. Students of the environment and neuroscience require a common set of chemistry skills including basics of organic and inorganic structure and nomenclature, stoichiometry, solution properties, gas laws, non-covalent interactions, kinetics, equilibria, and elementary acid-base and redox reactions. Most importantly, they must have grounding in the chemistry of proteins, nucleic acids and other biological molecules that they will encounter in the complementary course BISC 101 General Biology for the Environment and Life. As Environmental Studies and Neuroscience students will frequently evaluate information related to the concentrations of various substances, it is essential to have some exposure to chemical measurements as well. In a standard chemistry curriculum leading to a BS degree in that subject these topics would be presented over the course of five or more semesters of study. The complementary laboratory features representative exercises from general, organic and analytical chemistry selected to be most appropriate for environmental studies and neuroscience.

**Textbook:** Kenneth W. Raymond, General, Organic, and Biological Chemistry: An Integrated approach, 3<sup>rd</sup> Ed., Wiley, 2010, ISBN 978-0-470-50476-5.

*Chemistry 103 Laboratory Manual* available in the bookstore.

Lab Notebook: Hayden McNeil lab notebooks, ISBN 978-0-7380-5587-9.

**Calculator:** To have a level playing field, CHEM 103 requires everyone use the **same** calculator during exams. The Casio FX-S260 Solar, which is about \$10. Please familiarize yourselves with how to use this calculator.

**Other:** Eye protection must be worn in all laboratories whenever any laboratory work is in progress. A lab coat, closed-toe shoes, and long pants must be worn when doing experimental work. Shorts and sandals are NOT allowed in the laboratory. You will not be allowed to participate in the experiment if you are not wearing the appropriate protective clothing.

**SI:** The University has a Supplemental Instruction Program (<http://www.usc.edu/dept/LAS/si/>) that we encourage you to use. The SI instructors hold weekly sessions going over the course material and problems. They also prepare mock exams, which you can use to test yourself before the midterms and finals. The SI leaders attend all of the lectures and are familiar with the lecture material.

**Website:** The course website provides administrative information for both lecture and laboratory. Selected course materials are available online such as lecture slides, exam study material, exam keys, and secured access to your grades. *You must set up a password to access the website using the link in the upper left hand corner of the page.*

**Grading:** There will be two one-hour exams and a final exam. Your grade will be determined according to the following distribution:

Quizzes	10%
Exam 1	25%
Exam 2	25%
Lab Reports	15%
Final exam	<u>25%</u>
	100%

To receive a passing grade, satisfactory work must be done in both lab and the lecture portions of the course. You are encouraged to check your grades on the Chem 103 website.

**Quizzes:** There will be quizzes administered at the beginning of several of the laboratories. **No make up quizzes will be administered.** These quizzes will commonly test on preparation for the day's laboratory as well as lecture material from the previous week.

**Exams:** There will be two midterms and a final. No make up exams will be given. ***An unexcused missed hour exam, will not be dropped, and will be counted as a zero towards your final grade.*** The final exam will be given on *Thursday, May 9, 2013, 2:00 p.m. – 4:00 p.m.* Although it will be comprehensive, lecture material covered after the second hour exam will be emphasized.

<b>Exam 1</b>	Thursday, February 14	Ch 1-5
<b>Exam 2</b>	Thursday, March 28	Ch 6-10
<b>Final</b>	Thursday, May 9	2:00 - 4 pm

All electronic devices such as cell phones are prohibited and cannot be used for any purpose during the exam, including keeping time. No one will be allowed to enter the exam room late or to leave early. Graded exams will be scanned and available for viewing/printing from the class web site via the class password you set up.

**Regrades:** Graders try to be as fair, accurate, and fast as possible when grading exams, but occasionally, graders do make mistakes. We rely on you carefully to review your graded exams with the posted key and bring any grading errors to our attention. If your exam was not graded according to the key, please submit regrades no later than **3 days** after exams are returned electronically. Only online regrade requests are accepted; go to the course website and click "Grades/Exams" to access the regrade form.

The regrade will be returned to you electronically and will be graded according to the posted grading rubric. **Please do not use the regrade request as a forum to argue with the content of the key.** If your answer is not consistent with the key, you likely did not answer the question correctly or completely, and were not awarded full credit. The instructor reserves the right to regrade the entire exam. **Please note that it is possible that your score will go down after a regrade.**

**Drop Dates:** Friday, February 1, 2013: Last day to drop without a mark of W.

**Friday, April 12, 2013:** Last day to drop with a mark of W.

If you drop the lecture, you must also drop the lab. The mark of Incomplete (IN) may only be given to a student who is doing passing work through April 12, 2013 and is unable to complete the assigned work due to serious illness or a documented emergency occurring after April 12, 2013 .

**Attendance:** ***This is a laboratory course and attendance to all lab periods is mandatory. No make-up labs can be given in this course.*** Absences will be excused only for medical reasons or in the case of extreme necessity. Written excuses or student health center slips must be presented to the instructor for approval and should be secured in advance whenever possible. In the case of an excused absence, a grade will be assigned which is based on the average of the student's class rank. Any unexcused absence will result in a grade of zero for that laboratory. The instructor reserves the right to drop any student for excessive absences from laboratory. Students who miss **three or more experiments** will automatically fail the course regardless of their lecture performance.

**Absences:** Make-up exams will not be given under any circumstances. Chronic, unexcused absence from lecture and/or laboratory (more than two unexcused absences) will result in a grade penalty above and beyond missed work or exercises. Absences will be excused based on official University policy (verifiable illness or necessity). An excused absence from an exam will be granted only on the basis of proper documentation, for instance a certification provided by a physician or hospital. **Students must take at least one of the two midterms, and the final.**

**Homework:** Prior to lecture *read the sections to be covered in advance.* This will make the lectures easier to follow. *All of the problems interspersed in the text after many sections should be worked immediately after reviewing each section.* This will provide needed practice and reinforcement. *Work all of the assigned problems.* Homework problems from the book will be assigned regularly (on the course website) but will not be graded. *Working problems is the single best way to learn chemistry and the more the better. Only by working problems will you be able to test your knowledge of the material and your skill in applying it.* If you have difficulties with some of the problems, it usually means that your knowledge or ability to apply this knowledge is insufficient. In this case, restudy the material in your notes and your text. If that does not help, seek assistance from your instructor or TA's. *Remember that the exam questions will be of a level of difficulty similar to that of the end of chapter problems and may occasionally be selected from homework problems.*

**Lab Reports:** Lab reports are due at the beginning of your assigned laboratory period one week after each lab is completed. There are ten laboratory assignments worth 15 points each. See laboratory report guidelines for more information on lab reports. Late lab reports will be accepted up to two days late, for a maximum of 10 possible points, after which they will not be accepted for any reason. There are no regrades for lab reports.

**Students with Disabilities:** Any student requesting academic accommodations based on a disability is required to register with DSP, Disability Services and Programs, each semester. A letter of verification for approved accommodations can be obtained from DSP. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

**Academic Integrity:** USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/scampus/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>. The Trojan Integrity Guide can be found at <http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf>. The

## Tentative Lecture Schedule Spring 2013

Week 1: Chapter 1 Science and Measurements and Chapter 2 Atoms and Elements  
Week 2: Chapter 3 Compounds  
Week 3: Chapter 4 An Introduction to Organic Compounds  
Week 4: Chapter 5 Gases, Liquids and Solids  
Week 5: Chapter 6 Reactions (Free energy and Kinetics) and Midterm 1 (Chapters 1-5)  
Week 6: Chapter 7 Solutions, Colloids and Suspensions  
Week 7: Chapter 8 Lipids and Membranes  
Week 8: Chapter 9 Acids, Bases and Equilibrium  
Week 9: Chapter 10 Carboxylic Acids, Phenols and Amines  
Week 10: Review and Midterm 2 (Chapters 6-10)  
Week 11: Chapter 11 Alcohols, Ethers, Aldehydes, and Ketones  
Week 12: Chapter 12 Carbohydrates  
Week 13: Chapter 13 Peptides, Proteins and Enzymes  
Week 14: Chapter 14 Nucleic Acids  
Week 15: Chapter 15 Metabolism and Review

## Suggested Homework Problems

Kenneth W. Raymond, General, Organic, and Biological Chemistry: An Integrated approach, 3<sup>rd</sup> Ed.,

Chapter 1: 25, 27, 39, 41, 43, 45, 47, 51, 57, 61, 71, 79, 81

Chapter 2: 1, 5, 15, 19, 31, 57, 65, 75, 85, 95, 99, 101, 107, 109

Chapter 3: 1, 11, 21, 35, 47, 49, 55, 57, 61, 65, 67

Chapter 4: 1, 3, 9, 11, 13, 18, 23, 31, 33, 37, 39, 45, 49, 51, 53, 57, 59, 63, 65, 69, 71, 75, 83, 85, 91, 95, 97, 99, 101, 105, 107

Chapter 5: 1, 9, 15, 29, 35, 37, 43, 45, 53, 59, 67, 71, 77, 79, 81, 87, 89

Chapter 6: 1, 3, 7, 9, 11, 15, 21, 27, 47, 53, 59, 69, 81, 83, 87, 101, 123, 125, 129, 131

Chapter 7: 1, 3, 5, 7, 9, 19, 21, 25, 35, 39, 43, 45, 51, 59, 67, 69, 77, 81, 87, 91, 93, 95

Chapter 8: 1, 3, 5, 9, 11, 13, 15, 21, 25, 27, 31, 35, 41, 43, 47, 49, 55, 59, 63, 67, 69, 77, 79, 81, 83, 87, 89, 91, 93, 99, 101, 103

Chapter 9: 1, 3, 5, 7, 9, 11, 17, 19, 25, 27, 37, 39, 41, 47, 51, 53, 57, 59, 65, 67, 71, 73, 77, 79, 81, 83, 85

Chapter 10: 1, 3, 5, 9, 11, 15, 19, 21, 37, 41, 43, 45, 51, 53, 55, 59, 61, 63, 69, 74, 77, 79

Chapter 11: 1, 3, 9, 13, 19, 23, 27, 31, 33, 37, 49, 51, 57, 59, 65

Chapter 12: 1, 3, 7, 17, 19, 27, 33, 35, 37, 39, 45, 47, 49, 51, 57, 61, 63, 65, 71, 72

Chapter 13: 1, 3, 5, 7, 9, 13, 17, 19, 21, 23, 27, 29, 35, 37, 39, 47, 49, 53, 55, 57, 59, 63, 65, 67, 71, 73 (answer the question for translation not transcription), 77, 81, 85, 87, 89

Problems for Chapters 14 and 15 will be posted at a later date.

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## Tentative Laboratory Schedule Spring 2013

Week 1: Laboratory Check in and Safety Orientation  
Week 2: 1. Density: Measurements and Error  
Week 3: 2. Synthesis of Biodiesel  
Week 4: 3. Volumetric Analysis of a Hydrogen Peroxide Solution  
Week 5: No Lab EXAM 1  
Week 6: 4. Volumetric Analysis: Acid-Bases Titrations  
Week 7: 5. Spectrophotometry: Color and Concentration  
Week 8: 6. The Law of Mass Action: Le Chatlier's Principle  
Week 9: 7. Synthesis of Aspirin  
Week 10: No Lab EXAM 2  
Week 11: 8. Thin Layer Chromatography/ Extraction  
Week 12: 9. Synthesis of Nylon/Check out  
Week 13: 10. Molecular Structures  
Week 14: 11. Protein Data Base  
Week 15: No Labs

All Laboratory Reports are due at the beginning of lab on the following week.