

University of Nevada, Las Vegas – Spring 2016
CHEM 122A, Section 1003: General Chemistry II

Lecture: MW 8:30 – 9:45 a.m.

Office Hours: M, Th: 10-11 am; TW: 2-3 pm; or by appointment – Regular office hours are held in CHE-109 (the Chemistry Learning Center)

Course Web Page: <http://webcampus.unlv.edu> (choose UNLV, log in, and choose chem. 122)

Required Texts: *Chemistry: The Central Science* by Brown, LeMay, Bursten, Murphy & Woodward, 13th edition (You can either use the complete text or Volume 2, covering the last half of the book. Older editions of the book will have similar content, but I cannot guarantee that the problems I recommend from the end of each chapter will line between the 13th and older editions.)

Other Materials: You will need a scientific calculator (with scientific or exponential notation and log functions) for **each lecture**. **This calculator must NOT have the ability to save text. Calculators that can save text (including cell phone calculators and graphing calculators) cannot be used during the exams.**

During the semester, you will complete a number of online homework assignments. The dates on which these assignments are due are listed in this syllabus. You will access these homework assignments through the Sapling Learning website. You will need to create a Sapling Learning Account and purchase access to their homework site (\$34 for 1 semester). Instructions for creating a Sapling Learning Account can be found in the “Online Homework” section of this syllabus.

Special Notes: Please see the last page of this syllabus for official UNLV policies related to this course.

Welcome to General Chemistry at UNLV! ☺ I look forward to working with you this semester, and I encourage you to come by the Chemistry Learning Center during office hours or by appointment to discuss any questions or difficulties you have. I am confident that working together we will be able to build a positive learning environment to explore many exciting and challenging chemistry topics. – Dr. O

CATALOG DESCRIPTION

Application of chemical principles to properties of inorganic substances. Emphasis on kinetics, equilibria, thermodynamics, and electrochemistry. Credit not allowed in both CHEM 122 and CHEM 122A. 3 Credits. Enrollment requirements: CHEM 121 or CHEM 121A and CHEM 121L. MATH 127 or MATH 128 or higher. Coreq: CHEM 122L is required if enrolling in CHEM 122A for the first time.

COURSE OBJECTIVES

Upon completion of this course, you will be able to:

1. Describe the key factors affecting reaction rates and identify the order of chemical reactions based on graphical data;
2. Perform calculations related to the rates of chemical reactions;
3. Explain the equilibrium state both macroscopically and microscopically;
4. Perform equilibrium calculations, including those involving acid-base equilibria and ionic equilibria;
5. Apply Le Chatelier's principle to predict the effect of a disturbance on a chemical equilibrium;
6. Characterize compounds as acids or bases according to the Arrhenius, Bronsted-Lowry, or Lewis theories;
7. Perform basic pH and titration calculations;
8. Determine the solubility of an ionic compound;
9. Use entropy, enthalpy, and free energy; an equilibrium constant, or cell potential to predict whether a reaction favors the products or the reactants;
10. Perform calculations related to free energy, equilibrium constants, and cell potential;
11. Balance redox equations using the half-reaction method;
12. Explain the components and function of voltaic and electrolytic cells;
13. Predict the mechanisms of radioactive decay for unstable nuclei;
14. Calculate the binding energy associated with nuclear fission; and
15. Describe and explain the properties of coordination compounds.

Please remember to turn off your cell phone prior to coming to class. (Studies show that students who check their phones during class earn, on average, half a grade lower than students who turn their phones off during class!)

*******Tentative Schedule*******

Dates	Textbook	Lecture Topic	Online Homework
Jan. 20	Chapter 14	Chemical Kinetics	Extra credit online homework assignments due before 11:55pm Friday, January 22
Jan. 25	Chapter 14	Chemical Kinetics	Online Homework Assignment #1 due before 11:55 pm on Friday, January 29
Jan. 25	*****	<i>Last day to withdraw with 100% refund</i>	
Jan. 27	Chapter 14	Chemical Kinetics	
Feb. 1	Chapter 14	Chemical Kinetics	Online Homework Assignment #2 due before 11:55 pm on Friday, February 5
Feb. 3	Chapter 15	Chemical Equilibrium	
Feb. 8	Chapter 15	Chemical Equilibrium	Online Homework Assignment #3 due before 11:55 pm on Friday, February 12
Feb. 10	Chapter 15	Chemical Equilibrium	
Feb. 15	*****	<i>Washington's Birthday Recess – No Class</i>	
Feb. 17	Exam I	Chapters 14 & 15	
Feb. 22	Chapter 16	Acid-base Equilibria	Online Homework Assignment #4 due before 11:55 pm on Friday, February 26
Feb. 24	Chapter 16	Acid-base Equilibria	
Feb. 29	Chapter 16	Acid-base Equilibria	Online Homework Assignment #5 due before 11:55 pm on Friday, March 4
Mar. 2	Chapter 17	Additional Aspects of Aqueous Equilibria	
Mar. 7	Chapter 17	Additional Aspects of Aqueous Equilibria	Online Homework Assignment #6 due before 11:55 pm on Friday, March 11
Mar. 9	Chapter 17	Additional Aspects of Aqueous Equilibria	
Mar. 14	Chapter 17	Additional Aspects of Aqueous Equilibria	
Mar. 16	Exam II	Chapters 16 & 17	
Mar. 21	*****	<i>Spring Break – No Class</i>	
Mar. 23	*****	<i>Spring Break – No Class</i>	
Mar. 28	Chapter 19	Chemical Thermodynamics	Online Homework Assignment #7 due before 11:55 pm on Friday, April 1
Mar. 30	Chapter 19	Chemical Thermodynamics	
Apr. 1	*****	<i>Last Day to Withdraw from Classes</i>	
Apr. 4	Chapter 19	Chemical Thermodynamics	Online Homework Assignment #8 due before 11:55 pm on Friday, April 8
Apr. 6	Chapter 20	Electrochemistry	
Apr. 11	Chapter 20	Electrochemistry	Online Homework Assignment #9 due before 11:55 pm on Friday, April 15
Apr. 13	Chapter 20	Electrochemistry	
Apr. 18	Chapter 20	Electrochemistry	
Apr. 20	Exam III	Chapters 19 & 20	
Apr. 25	Chapter 21	Nuclear Chemistry	Online Homework Assignment #10 due before 11:55 pm on Friday, April 29
Apr. 27	Chapter 21	Nuclear Chemistry	
May 2	Chapter 23	Transition Metals & Coordination Chemistry	Online Homework Assignment #11 due before 11:55 pm on Friday, May 6
May 4	Chapter 23	Transition Metals & Coordination Chemistry	
May 11	8 a.m.	FINAL EXAM (WEDNESDAY)	

***With the exception of the exam dates, this schedule is subject to change. Students should verify the content covered by each exam.**

LECTURE

Attendance at lectures is essential and expected. You are responsible for all announcements and concepts covered in lecture. During lecture I will present concepts, show animations/movie clips, and provide an opportunity for you to begin to practice new skills both individually and through group activities and quizzes (see "Group Work"). To get the most out of lecture, read the suggested pages in your text before coming to lecture. "Skeleton" lecture notes are available on our WebCampus course site under "Course Material" at least 2 days prior to each lecture. Print the skeleton notes, and bring them to lecture. During lecture, take notes on your outlines. Study tip: After lecture, read the text again along with your completed notes, and work the relevant end of chapter problems. The lecture schedule below, with the exception of exam dates, is subject to change.

GROUP WORK

During the first lecture, I will ask you to form small groups. You will be expected to sit with your group members in lecture in order to participate in group activities and quizzes. Group work is an important element of this course because it has a positive impact on student learning and retention of material and provides you with an opportunity to improve your teamwork skills. I've also found that, personally, I learn more and enjoy learning more when I am doing it with a group of people.

PRE-CLASS PROBLEMS

When you arrive at class each day, I will post 1-3 problems for you to complete before class begins. I usually pick these problems based on the previous class's topics that students are finding difficult in lab, class, or the online homework assignments. I also choose questions that are similar to upcoming exam questions. I expect you to work on these problems when you get to class. They are excellent study aids for upcoming exams. I will give 5 points extra credit (added to your next semester exam) for groups who present their solutions to these problems to the rest of the class.

RECOMMENDED PRACTICE PROBLEMS/HOMEWORK

On the last page of the syllabus, I have included recommended practice problems of those that are included at the end of each textbook chapter. I have also posted extra practice problems on the WebCampus site under "Course Material," and I suggest doing the problems I posted in WebCampus before attempting the book problems. The purpose of these practice problems is to allow you to practice the kinds of questions that will help you gauge your understanding of the material. The suggested problems are the *minimum* number of problems that you should work in order to master the course material.

LEARNING OBJECTIVES

At the beginning of each chapter, I will provide a list of learning objectives for the chapter on the WebCampus site under "Course Material." This list will give you an idea of the concepts and skills that I believe are important for you to understand or have. You can think of these lists as study guides for the chapters. I suggest that you print out the lists before we cover the topics in lecture so you can mark your notes in accord with the learning objectives.

SUPPLEMENTAL INSTRUCTION

This semester, we are lucky to have a supplemental instruction leader working with our class. Josh Adams has taken the class previously, so he knows the material and what I expect you to learn and do for the exams. He can be a great resource. He will hold weekly supplemental instruction sessions where you can come to ask questions, work on problems, and try to explain various chemical phenomena. He will also hold one office hour each week.

Supplemental Instruction Leader:

Josh Adams (Email: joshua.adams@unlv.edu)

Supplemental Instruction Dates and Times:

Tues/Thurs 1:00 – 2:00 pm

Supplemental Instruction Location:

CBC A106

Josh's Office Hour:

Wednesday 10-11am CHE 109

COURSE GRADES

Three Midterm Exams (100 points each)	300 points
Online Homework	110
Group Quizzes/In-class Group Work (lowest quiz dropped)	50
Final Exam	150
	<hr/>
	Total 610 points possible

- *Midterm Exams:* Three 100-point exams will be given. Because the course content builds during the semester, you can expect each exam to be somewhat cumulative in nature. **There are no make-up exams;** however, your lowest midterm grade will be replaced with your final exam *percentage* if you perform better on the final. The purpose of this bonus is to reward improvement and to prevent a severe grade penalty for one low unit test score. If you do miss a midterm exam, it (the zero score) will be dropped and replaced by the final exam percentage.
- *Special Circumstances:* An alternate exam may be administered prior to the scheduled time *only* in cases where travel for a university sanctioned business or function, which cannot be rescheduled, interferes with an exam date. *If such plans do interfere with an exam date, then it is your responsibility to schedule an alternate exam date prior to the scheduled date. This alternate date must be finalized at least two weeks prior to the scheduled exam date.* You must show proper documentation from the appropriate university official for an early exam to be administered.
- *Final Exam:* Your final exam will be cumulative and worth 150 points. **Failure to submit a final exam will result in a grade of "F" for the course.**
- *Online Homework:* During the semester, you will complete eleven online homework assignments (due in most non-exam weeks). The dates on which these assignments are due are listed in this syllabus. You will have access to each homework assignment the Saturday before it is due. Each assignment will be worth 10 points, although the

number of problems in the individual assignments will vary from week to week. There will be a 20% penalty for each incorrect attempt at an answer to a given problem. No homework scores will be dropped, and no deadline extensions will be given on homework assignments. NOTE: **Your computer must have Adobe Flash installed in order to access the online homework.**

- *Accessing your online homework assignments:* You will access these homework assignments through the Sapling Learning website. You will need to create a Sapling Learning Account and purchase access to their homework site (\$34 for 1 semester). Instructions for creating a Sapling Learning Account are included below and can also be found at <http://bit.ly/saplinginstructions>:
 1. Go to <http://www2.saplinglearning.com/> and click on "US Higher Ed" at the top right.
 - 2a. If you already have a Sapling Learning account, log in and skip to step 3.
 - 2b. If you have a Facebook account, you can use it to quickly create a Sapling Learning account. Click "Create an Account", then "Create my account through Facebook". You will be prompted to log into Facebook if you aren't already. Choose a username and password, then click "Link Account". You can then skip to step 3.
 - 2c. Otherwise, click "Create an Account". Supply the requested information and click "Create My Account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
 3. Find your course in the list (you may need to expand the subject and term categories) and click the link (University of Nevada, Las Vegas - CHEM 122 - Spring16 - ORGILL).
 4. Select a payment option and following the remaining instructions.

Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments. During sign up or throughout the term, if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling Learning support team is almost always faster and better able to resolve issues than your instructor.

- *Group Quizzes/In-class Group Work:* Throughout the semester, I will be assigning group work and group quizzes during lecture. Over the semester, I will collect 11 of these assignments (unannounced). Each assignment/group quiz will be worth 5 points. The lowest quiz will be dropped. **There will be no make-up group quizzes or in-class assignments.**

The course grade will be based on the following scale:

%	100-93	92-91	90-89	88-81	80-79	78-77	76-69	68-67	66-65	64-57	56-0
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F

*Although I will never raise the grading scale, I reserve the right to lower it at the end of the semester. The grade scale listed above is a guaranteed scale. After each exam, I will explain how I will determine grades and post a grade breakdown to show you where you stand in class.

HOW TO SUCCEED IN CHEMISTRY 122

Success is a matter of exposure and practice. The following are some tips for success in CHM 122.

- Attend **ALL** lectures.
- **KEEP UP** with the concepts being presented. Do a little studying daily or a few times a week. Do not put off your studying until the test. You must understand that **CHEMISTRY IS CUMULATIVE!** The concepts we learn this week will build on those that we covered last week. If you didn't "get it" the first time, you do not have the luxury of saying, "I don't understand/like this stuff. I can't learn it, so I'll do bad on this test and better on the next one." Chemistry doesn't work that way! If you don't understand the concepts we are learning now, you will have continued difficulty with the concepts we will learn in the future. If you get stuck, get help.
- Homework questions can provide you with a lot of practice if you approach them correctly. Do your homework problems as if you were taking a test. Only check your answers after you have completed a series of questions. This will allow you to identify the areas that you need to focus on. If you are having trouble with a particular area make sure you try the in chapter problems and the additional end of chapter problems that I did not assign.
- If you are having problems with a concept get help immediately; don't wait until 2 days before the test! Ask your friends, ask me, ask anyone who knows chemistry! Chances are good that, if you are having a problem, many people in the class are having the same problem. If you let me know what the question is, I can discuss it during class.

- Study with a tutor. Contact the Academic Success Center (contact information is on the next page) for information about potential tutors.
- Attend Supplemental Instruction sessions. In these sessions, an experienced student will help you practice and think about some of the more difficult concepts and problems from the course.
- Check out the Chemistry Learning Center (CHE-109) for free help. Faculty and/or TAs are in this Center from about 9am – 5pm Monday through Thursday and in the mornings on Fridays (check the room for the official schedule).
- When you study for exams, look over your lecture notes, the learning objectives, pre-class questions, and online homework questions. It will also help if you do as many practice problems as you can. In addition to the recommended practice problems, there are practice problems on the WebCampus site and on other sites that are linked to the WebCampus site.
- Please feel free to call on me for extra help. My contact information is on the first page of this syllabus.

ACADEMIC DISHONESTY

Cheating will not be tolerated in this course. See the official UNLV policies about academic misconduct and copyright on the last page of this syllabus.

RECOMMENDED PRACTICE PROBLEMS FROM THE BROWN, LEMAY, BURSTEN, MURPHY & WOODWARD TEXTBOOK

Chapter 14	5, 8, 9, 11, 17, 18, 19, 23, 25, 27, 29, 31, 33, 35, 37, 39, 40, 41, 43, 45, 49, 51, 55, 59, 61, 90, 96, 99, 103
Chapter 15	1, 2, 3, 6, 8, 9, 10, 11, 15, 17, 19, 20, 21, 23, 25, 27, 31, 33, 35, 37, 41, 42, 43, 47, 49, 51, 57, 59, 61, 63, 65, 67, 71, 77, 78, 81, 82, 83
Chapter 16	1, 2, 5, 10, 11, 12, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 41, 42, 43, 45, 47, 49, 51, 55, 57, 59, 61, 69, 71, 73, 75, 77, 83, 87, 88, 89, 91, 93, 95, 99, 109
Chapter 17	1, 3, 4, 8, 13, 14, 19, 21, 23, 25, 27, 29, 31, 41, 43, 45, 49, 50, 53, 55, 57, 61, 69, 71, 73, 75, 98, 100, 105
Chapter 19	3, 4, 5, 6, 7, 8, 9, 15, 17, 25, 27, 35, 37, 41, 43, 47, 49, 53, 55, 57, 59, 61, 67, 69, 77, 79, 81, 83, 89, 90, 93, 97, 103
Chapter 20	1, 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 19, 21, 23, 25, 29, 31, 35, 37, 39, 41, 43, 49, 51, 53, 55, 57, 63, 65, 67, 89, 91, 98, 102
Chapter 21	2, 4, 6, 7, 8, 9, 11, 13, 15, 19, 21, 29, 33, 37, 3, 41, 43, 47, 49, 61, 63, 72
Chapter 23	1, 8, 15, 17, 19, 25, 27, 29, 35, 37, 47, 48, 55, 57, 59

*Note: Many of the odd-numbered problems in the textbook are matched with even-numbered problems. If you need more practice with these problems, try those even-numbered problems!

UNLV POLICIES

Academic Misconduct — Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: <https://www.unlv.edu/studentconduct/student-conduct>.

Copyright — The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

Disability Resource Center (DRC) — The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy — Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Transparency in Learning and Teaching — The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information: <https://www.unlv.edu/provost/teachingandlearning>
<https://www.unlv.edu/provost/transparency>

Incomplete Grades — The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring and Coaching — The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895- 3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

UNLV Writing Center — One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>.

Rebelmail — By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always **@unlv.nevada.edu**. **Emailing within WebCampus is acceptable.**

Library Resources — Students may consult with a librarian on research needs. For this class, the subject librarian is https://www.library.unlv.edu/contact/librarians_by_subject. UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <https://www.library.unlv.edu/>.

Final Examinations — The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.