

Chemistry 102—Spring 2013

Lecture Section and Location	Instructor	Contact	Office hours
MWF 8:00 – 8:50 a.m. SH C141	Dr. Scott Nickolaisen ASCB 122A	(323) 343-2382 snickol@calstatela.edu	MW 11:30 a.m. – 1:00 p.m. F 12:00 – 1:00 p.m.
Recitation Section and Location	Instructor	Contact	Office Hours
Sec 02 Th 10:40 a.m. SH C238	Dr. Scott Nickolaisen ASCB 122A	(323) 343-2382 snickol@calstatela.edu	MW 11:30 a.m. – 1:00 p.m. F 12:00 – 1:00 p.m.
Sec 03 Th 11:40 a.m. SH C367	Dr. Scott Nickolaisen ASCB 122A	(323) 343-2382 snickol@calstatela.edu	MW 11:30 a.m. – 1:00 p.m. F 12:00 – 1:00 p.m.
Sec 04 F 9:50 a.m. BS 246	Dr. Scott Nickolaisen ASCB 122A	(323) 343-2382 snickol@calstatela.edu	MW 11:30 a.m. – 1:00 p.m. F 12:00 – 1:00 p.m.
Laboratory Section and Location			
Sec 05 M 1:30 p.m. ASCL 156	Dr. Yong Ba ASCB 122B	TBA	TBA
Sec 06 T 1:30 p.m. ASCL 156	Dr. Yong Ba ASCB 122B	TBA	TBA
Sec 07 W 1:30 p.m. ASCL 156	Dr. Greg Santillian ASCL 253	TBA	TBA

Required Materials

- Principles of Chemistry: The Molecular Science, Moore, Stanitski, Jurs.
 - OWL username and password bundled with new textbook or purchased separately at <http://www.cengage.com/support/>
 - Experiments for General Chemistry (4th) edition, *Goldwhite and Tikkanen*
 - Bound laboratory notebook
 - Scientific calculator
 - Ability to access the Chemistry department web site: <http://www.calstatela.edu/dept/chem/class-notes.htm>
- (please note the website will be under revision)
- E-mail address (this is free at King Hall D-150 if you don't already have one) and CSLA NIS account
 - Ability to access internet site for electronic homework assignments
 - Safety glasses or goggles that meet the Z-87 specification ("Z-87" will be imprinted somewhere on the glasses if they meet it)
 - Chemistry Breakage Card (\$10 at cashiers office (Adm.128))

Suggested Materials and Supplies

- Molecular models
- Lab jacket or apron

Course Description

Chemistry 102 is a rigorous 5-unit course that demands approximately 20 hours of study per week in addition to lecture, recitation and laboratory attendance. Chemistry 102 is the second quarter of a three-quarter sequence that provides a foundation in the chemical sciences suitable for premedical, pre-pharmaceutical, engineering and science majors. Students are required to have received a grade of C- or better in the prerequisite Chemistry 101 course or its equivalent, covering approximately the material in Chapters 1 through 8 of the assigned text. Students are required to be concurrently enrolled in one lecture section, one lab section, and one recitation section.

Electronically graded homework (EHW) will be assigned on a weekly basis, and these scores will be incorporated into your final grade. Each student's homework set will be identical in difficulty, but different in the problems' specifics. You will need to be vigilant in the completion of these assignments—the computer may be set to give you a limited number of tries to obtain the correct answer. The deadline to complete each EHW set will be posted for each assignment. Homework sets completed after the deadline will not be accepted. You may begin work on EHW sets any time before the weekly deadline. It will be of great help to you and your grade if you review some of the problems at the end of each chapter and the tutorials and practice problems available on the OWL site before attempting the EHW sets. EHW sets can be accessed at <http://owl1.thomsonlearning.com/>

Human-graded homework will be due weekly at your laboratory recitation meeting. These problems will be *more* difficult than the e-graded homework and will bear a stronger resemblance to the types of problems you should expect on your examinations. These will be graded by your recitation instructor and returned to you on a schedule set by your instructor.

Course Goals and Objectives

The goals of this course are to contribute to the mastery of scientific literacy, critical thinking, problem solving, and idea integration skills necessary for students pursuing careers in technological disciplines. Reading, problem solving, performing experiments, writing reports, participating in discussions facilitated by the instructor, small-group activities, and lectures will be employed to accomplish these goals. Upon completing this course students will be able to:

- Demonstrate knowledge of fundamental concepts in chemistry including the fundamentals of chemical bonding, deduction of and ramifications of molecular structures; properties of gases, liquids, and solids; solution chemistry; and rates of chemical reactions.
- Demonstrate quantitative reasoning skills including proficiency in calculation skills, and the ability to accurately interpret numerical data.
- Demonstrate an ability to solve problems competently using approximation, precision, accuracy, and statistical validity.
- Demonstrate an ability to generate accurate and precise data safely, record data clearly, analyze data ethically and interpret scientific data critically.

- Demonstrate an ability to describe scientific results using clear, concise language and following the principles of academic integrity in formal written laboratory reports.

Chemistry 102 is designed not only to introduce students to fundamental knowledge and behavior in the chemical sciences, but provide students with the skills necessary to successfully reach their individual career objectives. Students should consider the time devoted to this course an investment in their future.

Requirements

The prerequisite for this course is a passing grade in Chem 101 or its equivalent.

Students are required to conduct themselves in a professional manner during class. Cell phones, pagers and other electronic devices must be turned off during lecture. Late arrivals, side-discussions and other unprofessional behavior will be addressed at the instructor's discretion. Attendance may be recorded. Students returning from absences are advised to copy lecture notes from students in their study group.

Students are required to take quizzes and examinations designed to measure each individual's understanding of the course objectives cited above, which will include both problem solving and essay responses. Weekly quizzes will be administered during recitation. Unannounced quizzes, including instant response quizzes, may be given during lecture at the discretion of the instructor. Students are required to take two midterms and a final examination. Make-up exams will not be available for midterm exams, and will only be made available for the final exam at the discretion of the instructor for medical emergencies or other extreme situations verified in writing by a third party. For example, in case of medical emergency, the student must provide a signed physician's note to the instructor before a make-up exam will be scheduled.

Students must be concurrently enrolled in Chemistry 102 recitation and laboratory sections to take this course. Students will perform experiments that demonstrate the basic concepts of chemistry and microscopic properties, and prepare written reports describing the principles, techniques, results, conclusions, and sources of experimental error in these experiments. This is a very important component of this course worth approximately 22% of your grade.

Study Suggestions

- Study illustrations and diagrams and read the text before attending lectures.
- Do as many challenging problems as possible without relying on solution keys.
- Work additional problems and review for the exams with 3-4 member study groups.
- Get help from the University Tutorial Services staff and your instructors in a timely manner.
The office hours of all Chemistry 102 instructors are posted in the Department office.

For more study tips, read the Preface of your textbook.

Grading

The grade in this course is assigned largely on the basis of points accumulated through activities in the following categories:

Section	Activities (points)	Total Points Possible
Lecture	Two Midterm Exams @ 150 points each	300
Lecture	E-graded Homework	100
Lecture	Final Examination	200
Recitation	Logarithm Exercises (15), eight best 10-point recitation quizzes (80), hand-graded homework (50)	145
Laboratory	Laboratory Reports (200) and technique (20)	220
	TOTAL	965

The instructor may make minor changes to the total number of points as necessary. Additional quizzes given during lecture may be used to assign extra credit. You must pass the lecture with at least 50% of the points, and you must also pass the laboratory/recitation with at least 50% of the points. The instructor will provide details of the requirements for specific letter grades as the quarter progresses. Plus and minus grades will be issued in this course. ***If you fail either the lecture or the laboratory/recitation, you will not pass the class!***

Dropping, Incompletes and Withdrawals

It is the University's hope that nobody withdraws from any course. Before you consider withdrawing, you should be aware of the University Policy on withdrawal: you are not allowed to drop a course because you have found the workload to be too heavy, or because you are getting a poor grade. It is your responsibility to be aware of these policies. Also, you should be aware that there are specific policies on the incomplete grade, IN. It is not automatically given—you must request it from your instructor who is not allowed to give an IN grade unless certain conditions are met. Consult the schedule of classes and your University catalog for details.

Schedule of Topics and Laboratories

The scheduled list of topics and laboratory exercises is tabulated below. The homework solutions will be posted after the due date using the library's electronic reserves.

Week	Topics (Chapter)	Goldwhite & Tikkanen Lab Experiments (Points)	Hand-graded Homework Problems (Week Due)
1	Molecular Structures (9)	Check-in	Ch 9: 25, 31, 39, 55, 58 (due week 1)
2	Molecular Structures (9)	#11 Synthesis of benzoic acid (20)	Ch 9: 63, 70, 72, 74, 76 (due week 2)
3	Gases and the Atmosphere (10)	#9 Molecular Models (25)	Ch 10: 30, 39, 41, 45, 54 (due week 3)
4	Gases and the Atmosphere (10)	#6 PV relationship for a gas and determination of R (25)	Ch 10: 57, 59, 71, 74, 76 (due week 4)
5	Liquids, solids and materials (11)	#7 Molar mass by vapor density (25)	Ch 11: 26, 32, 43, 63, 68 (due week 5)
6	Chemical Kinetics (12)	#19 Synthesis and Analysis of Sodium Bicarbonate & Sodium Carbonate (50)	Ch 12: 18, 24, 28, 36, 48 (due week 6)

7	Chemical Kinetics (12)	#19 (continued)	Ch 12: 51, 68, 76, 77, 79 (due week 7)
8	Chemical Equilibrium (13)	#12 Paper chromatography (25)	Ch 13: 28, 34, 38, 66, 70, (due week 8)
9	Chemical Equilibrium (13) Chemistry of Solutions and Solutes (14)	#23 Chemical kinetics (30)	Ch 13: 71, 72 Ch 14: 36, 40, 54 (due week 9)
10	Chemistry of Solutions and Solutes (14)	Check- out; review for final	Ch 14: 61, 66, 68, 72, 77 (due week 10)

Exam Schedules

The first midterm exam will be given approximately during the 3rd or 4th week of classes, and the second midterm exam will be given approximately during the 7th or 8th week. The exact dates for each exam will be announced in class. The final exam will be comprehensive and will be given on the Friday, June 14 at 8:00 a.m..

Recitation

The recitation provides students with an opportunity to ask questions in a small-class setting, clarify topics covered in lecture, discuss the theoretical aspects of laboratory exercises and develop problem-solving skills. Students will have a weekly quiz in their recitation, and written homework is due when their recitation meets.

Laboratory

In all experiments you are required to wear safety glasses that meet the Z-87 standards at all times during the laboratory period. ***If you do not have appropriate eye protection, you will have to leave the laboratory and lose the points for that experiment.***

During the experiment students will enter data into bound laboratory notebooks. In experiments where students work with a partner, both need to enter the data into their respective notebooks before leaving the laboratory. After completing the experiment, the instructor will initial the page on which the student entered the data in their laboratory notebook. Laboratory instructors will provide details during the first class meeting.

The instructor will tell students when final written reports are due. Final reports submitted for grading will be either **neatly** written in each student's notebook following the data pages or prepared with a word processor with a photocopy of the original raw data attached. **All** laboratory reports will contain the sections described below:

- I. **Prelab:** A detailed description of how the student plans to perform the experiment. ***This section must be completed before coming to lab.*** The laboratory instructor has the discretion to grade these assignments.
- II. **Raw Data:** The initialed data (or photocopy) that the student collected in the lab period. Neatness is not imperative here, but it must be readable, with the data clearly labeled and the units of measurement listed. If this section is missing, the student will receive **ZERO** credit for that experiment.

Formal Report (graded)

- I. The student's name (and lab partner's name [if applicable]), date, and experiment title.
- II. **Purpose:** A brief description of the experiment and what the student intends to accomplish
- III. **Data:** A table containing the data the student collected in the experiment complete with units. In some cases the student may also want to include results in this table.
- IV. **Theory/Principles:** A summary of the concepts explored in the experiment. If there are mathematical equations used in your calculations, they are derived and explained here. This section is one of the most valuable sections in the reports in terms of the number of points. Just writing equations is not enough!
- V. **Experimental:** A section that may refer to the laboratory manual, but also describe deviations from or improvements to the procedure.
- VI. **Calculations:** A sample calculation showing how the student obtained their results.
- VII. **Results:** The results of each student's experiment in a table.
- VIII. **Conclusions/Discussion:** This section also carries a large share of points. In this section you compare your results to the accepted literature values whenever possible. Make sure to reference literature values; a good source is the **CRC Handbook of Chemistry and Physics**, which is in the reference section of the library. The student should also identify the most critical measurement (that which has the greatest uncertainty) and point out approximations that may affect the accuracy of your answer.
- IX. **Questions:** Answer the questions at the end of the experiment. Note that some of these questions are based on experimental results.

Laboratory Safety

Safety must be a primary consideration for all persons entering and working in a chemistry laboratory. The experiments have been chosen for their relation to lecture topics and to teach basic techniques. However, students have the responsibility to preview the experiment, learn and understand the appropriate safety precautions for each experiment and to consult with the instructor when safety procedures are not clear. Finally, the following general rules must be observed:

- Safety glasses must be worn at all times when *anyone* is doing experimental work in the lab.
- Smoking, eating or drinking are not permitted at anytime in the lab.
- Before beginning the first experiment, familiarize yourself with the location of safety equipment in the lab. These include the fire extinguishers, safety shower, fire blanket and eye wash. Your instructor will describe their appropriate use.
- Read your experiment and note any specific safety precautions.
- Work is not permitted in the labs except during regular class hours in the presence of an instructor. Performance of unauthorized experiments is not allowed.

Additional Information

Reasonable accommodations will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

Students are encouraged to review the University's policy on academic honesty in Appendix D of the University Catalog.