

Chemistry 100
Introduction to General Chemistry
Spring 2015
ENS 280, 4 units, MWF, 1:00 – 1:50 pm

| | |
|--|--|
| <u>Instructor:</u> | Professor John J. Love Department of Chemistry & Biochemistry Office: CSL 339 e-mail: jlove@mail.sdsu.edu |
| <u>Laboratory Coordinator:</u> | Kathy McNamara Office: CSL 313 email: kmcnamara@mail.sdsu.edu |
| <u>Course time:</u> | 1:00-1:50 p.m., MWF, ENS 280 |
| <u>Laboratory Rooms:</u> | CSL 522 or 524 |
| <u>Professor Love's Office hours:</u> | 12:00 - 1:00 p.m. Tues. & Thurs. in CSL 508 (if Dr. Love is not in CSL 508 then go to his lab/office in CSL 339). If necessary, see Dr. Love after class to make an appointment for an alternative time. |
| <u>Required Textbook:</u> | *An Introduction to General Chemistry, Second Edition (2006) I. Blei & G. Odian (W.H. Freeman and Company) ISBN-13: 978-1464198823 (978-0716770732; 978-0716743750) This is also available as an e-book through the Bookstore *Online homework card available through Bookstore Rentals are also available. *Online homework card available from bookstore |
| <u>Lab Manual (required):</u> | <u>Chem. 100 Lab Manual</u> , Chemistry Dept. |
| <u>i>clicker (required):</u> | The i>clicker Personal Response Pad, also called a clicker, can be purchased from the SDSU bookstore. |
| <u>Study aides (optional):</u> | <u>Study Guide for General, Organic, and Biochemistry</u> , Second Edition (2006) M.L. Gillette & W. Gloffke |
| <u>Handout site</u> | Most handouts, sample exams, exam reviews, HW answers, will be on the blackboard system. You will see a lab section and combined section on BB. (1st lab and some notes only) http://www.chemistry.sdsu.edu/courses/CHEM100/ |
| <u>Text web site:</u> | http://www.whfreeman.com/ |
| <u>Blackboard web site:</u> | http://blackboard.sdsu.edu 1) Combined sections: This syllabus and other handouts 2) Lab sections: Grades, announcements from your TA |
| <u>Additional required items:</u> | Non-programmable calculator (TI-30Xa), a stapler for lab assignments and matches or butane lighter for some laboratory exercises. Safety Glasses and apron are absolutely REQUIRED (bookstore). Gloves required for certain experiments. |

The course:

Course attendance Policy: Students are expected to attend **all** lectures.

Prerequisites: a working ability with high school level algebra.

Course enrollment: You must be enrolled in one laboratory section as well as lecture. If you do not attend the lab section in which you are enrolled, your spot may be given to another student.

Student Learning Outcomes: Chemistry 100 is an introduction to general chemistry. By the end of this course a successful student will be able to:

1. execute basic chemistry calculations such as unit conversions and stoichiometry;
2. explain the basic principles of atomic theory and chemical bonding;
3. quantitatively and qualitatively describe physical and chemical properties of matter;
4. illustrate the concept of dynamic equilibrium with acid-base chemistry;
5. analyze a problem and decide the best method to solve;
6. understand how the material relates to examples drawn from news and life;
7. combine material learned in individual chapters to form an overall "big picture";
8. safely and confidently conduct protocols in a laboratory environment.

This class requires A MINIMUM OF 15 hours of your time per week to complete! In order to be successful in this course, you will need to spend a considerable amount of extra (non-lab or classroom) time which is estimated to be, at minimum, 9 hours per week spent on reading, studying, and homework. Each chapter should be read prior to initial discussion in lecture. Rereading the text after lecture will help in understanding the material and reinforcing lecture topics. Homework problems are best completed as they are being presented and discussed in lecture. Do not put off study and homework assignments until the night before the exam or you will fail. Attendance at labs is a must, unless you are seriously ill and have legitimate documentation.

Many of you are interested in taking CHEM 200 after CHEM 100. The prerequisites for CHEM 200 are one year of high school chemistry, two years of algebra, and a passing score on the Placement Test, or a passing grade (C or higher, **not** a C-) in CHEM 100. Chemistry 100 is a demanding, 4-unit course which requires a large amount of time and your commitment to work hard! (Please do **NOT** take this course unless you are prepared to commit the necessary time and hard work.) It is advisable that you make Chemistry 100 the focus of your semester and that you do **NOT** overburden yourself with an unmanageable course load while taking this course. We very much want you to succeed in this course. **YOUR** success requires a large time commitment and hard work – please do **NOT** take this course unless you are willing to allow sufficient time to study, attend **ALL** lectures, and attend **ALL** labs with preparation in advance. You will enjoy your semester in Chemistry 100 – and you will benefit in the sciences so much more from all that you learn – if you allow yourself the necessary time to work hard and succeed! **YOU MUST ALLOW ADEQUATE TIME IF YOU TAKE THIS COURSE!**

Help room for CHEM 100: There will be a CHEM 100 Help-room in GMCS-203 for students seeking outside consultation and assistance on the course material. The Help-room will be staffed by the teaching assistants and will be open approximately 20 hours per week. The Help-room schedule will be posted on the CHEM 100 blackboard website and on the door of the Help-room at the beginning of the second week of class.

Office hours: It is highly recommend that you take advantage of the open office hours to ask questions that arise during your studies to your instructor or teaching assistants. Any student may attend the Professor's office hours or any TA office hours and you may attend as many office hours as you need. The schedule for office hours will be posted outside GMCS 203. It will also be available

for download on the course Blackboard site. Again, I urge you to advantage of these free tutorials, discussions of lecture/lab material, and homework help.

Textbook: You absolutely must purchase the textbook for this course (see page 1 for textbook title). You will be required to bring your textbook to **EVERY** class. Reading of certain textbook passages will be required during many of the lectures. The reading of key passages from the textbook will be followed with i>clicker questions.

Class Participation (Clickers): You are required to purchase an i>clicker remote for in-class participation. i>clicker is a response system (a remote) that allows you to answer questions that are posed during lecture. It is anticipated that there will be between three to five questions per lecture beginning with the second week of the semester. These questions are usually presented in multiple choice format and students typically have about 1 minute to respond using the i>clicker. A histogram of responses is displayed at the end of each exercise. The purpose of this exercise is to identify any misunderstandings with the material and encourage active learning. A small percentage of your total grade will derive from this form of in-class participation. In order for you to receive this credit, you **MUST** register your i>clicker remote for this class through a link in your SDSU Blackboard course menu. **In order to get i>clicker point credit you must register your clicker with this course through the SDSU Blackboard system.** This is different than registering your clicker with the clicker company (which is not necessary to receive credit for i>clicker points). You will use your i>clicker remote during almost every lecture and therefore you are responsible for bringing your i>clicker remote to every lecture. All information pertaining to i>clickers can be found at the SDSU website – <http://clicker.sdsu.edu/>. Students who forget their clicker, or if their clicker malfunctions (e.g., batteries fail) will **NOT** receive any points for that particular session.

A maximum of 50 total grade points can be earned from clicker participation. Each student receives one clicker point for participation per session (class), and an additional point if the student chooses the correct answer. At the end of the semester, a student's clicker points are added and then increased by 10% to allow for absences, malfunctioning clickers, and all other possible problems. The clicker points are then normalized to the maximum of 50 grade points. For example, if there are 100 clicker questions asked during the entire semester, there are 100 possible clicker question points. A student who earns 67 clicker points (after the 10% increase) will receive 33.5 grade points. [Let's say you earned 61 clicker points. 61 plus 10% of 61 is approximately 67. 67/100 x 50 possible points = 33.5 points total for clicker participation].

Statement on Cheating and Plagiarism: Academic honesty - Don't cheat! If you cheat you will receive an F for the course and possibly be expelled from SDSU. Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (*i.e.*, their intellectual property) so used as one's own work. The penalty for cheating and plagiarism is an F for the course and possible expulsion from the University. For more information on the University's policy regarding cheating and plagiarism, refer to the Schedule of Courses ('Legal Notices on Cheating and Plagiarism') or the University Catalog ('Policies and Regulations'). You will need to learn the material in this course and, more importantly, develop the problem solving skills required of this course to be prepared for upper division coursework and eventually a career.

Exams and grading: There will be 3 mid-term exams and one final exam given in class. The final is comprehensive and will be given on Friday May 8th, 2015 from 1:00-3:00 p.m. in ENS280. Six quizzes will be given in lab. Any absence from an exam or quiz, which is not excused **before** the exam will result in an automatic zero for that exam or quiz.

(next page)

| | | |
|--|-----------------|---|
| Exam 1 | 165 pts. | Chapter 1, 2, 3 |
| Exam 2 | 165 pts. | Chapter 4, 5, 6 |
| Exam 3 | 165 pts. | Chapter 7, 8, 9 |
| Final | 215 pts. | Chapter 1-10 |
| Quizzes | 50 pts. | 10 pts. /quiz (lowest dropped) |
| Lab | 180 pts. | 15 points/lab (lowest dropped) |
| Participation points (lab) | 10 pts. | Given by TA |
| Class Participation (i>clicker) points | 50 pts. | |
| Homework | <u>50 pts</u> | HW is online, at end of semester |
| | 1050 pts. total | the total of all HW points will be normalized to 50 |

The following grades are guaranteed for the percentages shown. It is possible that the percentages may be lowered, but they will not be raised for a given letter grade.

| | | | |
|---|-----|---|-----------|
| A | 90% | D | 60% |
| B | 80% | F | below 60% |
| C | 70% | | |

Dropping the course: It is your responsibility to follow university policies regarding Cr/NC, drops, withdrawals, and incompletes. The last day to legally withdraw from a class for the Spring 2015 semester is Tuesday, February 3rd, 2015.

Students with Disabilities: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at [619 594-6473](tel:6195946473). To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services.

Religious Observances: University Policy on Absence for Religious Observances includes the following statements: "By the end of the second week of classes, students should notify the instructors of affected courses of planned absences for religious observances. Instructors shall reasonably accommodate students who notify them in advance of planned absences for religious observances." Please notify the instructor in a timely manner and a reasonable accommodation will be reached.

Syllabus is Subject to Change: This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

Lab: Chemistry is an experimental science. As such, its principles are best illustrated in the laboratory setting. As a student in this course, you will have the opportunity to learn many basic principles of chemistry in a modern well-equipped laboratory environment. Learn the name of your laboratory teaching assistant (TA) and your lab section number for identification of homework, experiments, and exams.

All persons present in a chemistry laboratory must wear long pants or long skirt, apron or flame resistant lab coat, approved eye protection and closed-toe and closed heel shoes. Long hair must be confined securely. Shoulders must be covered (no tank tops). The only exception is during lectures. The eye protection, specific clothing and apron must be worn whenever anyone in the room is working with chemicals. Anyone not in compliance will be asked to leave and will not be allowed to return until properly attired. Additional PPE, such as gloves, may be required based on the experiment.

The lab work for Chem. 100 must be performed in CSL 522, 524 or 528 during the lab hours for which the student is registered. Because of logistical constraints, you will not be allowed to make up missed lab experiments; however, the lowest lab report score **will be dropped** when determining your course grade. Use this free pass wisely.

Remember, whenever any chemicals are in use anywhere in the room, everyone must wear appropriate clothing, goggles and closed toe and heel shoes. If you have forgotten your goggles then you must either borrow a pair from a friend, or buy new ones at the bookstore, or go home and take a zero on that lab. Any week which says "experiment" on the lab schedule indicates long pants/skirts, goggles and shoes will be required that lab day. Store a pair of shoes in your locker if you think you will forget to wear proper shoes. Lab reports are due at the end of the lab period. **Late reports will receive no credit.** No credit will be given for a lab report if the work was not actually done by that student

The lab report consists of the data pages and questions in the lab manual. Where computations are involved, numerical set-ups must be shown. The final answer must include units, if any, and the correct number of significant figures. Reports must be legible for full credit.

If you fail to check out of your locker at the end of the semester, there will be a fee of \$25. If you need to drop during the semester, you must check out of your locker before a drop is allowed.

Online Homework

The purpose of online homework is to allow students the opportunity to work at their own rates on problems that illustrate principles on which they will be tested during exams. Immediate help in the form of guided solutions, practice, and question help is available to students when doing problems. Multiple attempts are allowed for each problem, but if you cannot solve the problem after more than a couple of tries then please bring it to the help room in GMCS 203 for TA help.

The homework grade will be determined by the number of problems completed correctly online through the McGraw-Hill Connect Chemistry module. The ten online assignments correspond to the ten chapters covered in the textbook. Due dates for each of the assignments will be announced on the Blackboard combined section as each is assigned. Approximately 600 total problems will be assigned during the semester, and these 600 points will be scaled down to a total of 50 possible points that will be used in determining each student's final homework grade.

Each student must purchase their own Connect Chemistry access code from the SDSU bookstore. This code will also be available for purchase directly from the publisher and this option may save you money. A video will be available on the blackboard combined site to show you the HW site, how to sign up, and how to use it.

Homework - "Exercises" section at the back of each chapter in your book
Additional practice problems - One of the most common requests by students is more practice problems. The following problems from the "Exercises" section at the back of each chapter in your textbook are recommended to help with your mastery of the material prior to exams. It is recommended that you work on these in groups, identify concepts that are giving you trouble, and then bring your questions with you to office hours. Answer keys for practice problems from each chapter will be posted to the Combined sections Blackboard site.

| <u>Chapter</u> | <u>Problems</u> |
|----------------|--|
| 1. | 1-14, 18-24, 26, 29, 31, 33, 36, 38, 47-48, 54-56, 58, 60, 68 |
| 2. | 1-4, 9-10, 12-15, 17, 19-28, 33-42, 52-58 |
| 3. | 5-12, 15, 18, 19, 23-36, 42, 44, 46, 55, 57 |
| 4. | 1, 4-19, 22, 25, 27, 31-35, 40-42, 47, 73, 74 |
| 5. | 2, 8, 12-18, 21, 22, 25-30, 34, 36-38, 48, 49 |
| 6. | 1-2, 6-7, 11-12, 15-17, 20-24, 33, 35, 37, 39-43, 45-46, 48, 52-54, 59 |
| 7. | 2-4, 6, 10, 14-27, 29, 31, 34-36, 38, 49, 51-52, 55, 59-61, |
| 8. | 1-5, 9-11, 14-20, 23, 26-28, 31, 33 |
| 9. | 1-6, 8, 11-13, 15-21, 27, 28, 35, 36, 45, 51-54, 68, 72 |
| 10. | 1-8, 15, 17, 18, 43, 44, 49, 50 |

Worksheets will also be posted on Blackboard under "Course Documents". While their completion is not graded, they contain problems similar to what you will see on exams so I highly recommend completion.

There are 10 lab participation points available, these will be assigned at the discretion of lab TA at the end of the semester. Points are given based upon readiness of student for lab work, adequate cleanliness of lab space, respect for others in lab, checking out as assigned. As an example, arriving on time and prepared for every laboratory is expected.

10 steps to Chem 100 success

1. Read the relevant chapter in the book **BEFORE** coming to the lecture on that chapter. It may not make sense, but you will have an idea of where the material is headed and that will help you put concepts together.
2. Attend every lecture, take notes, and try to solve problems as they are presented. This means you must bring a calculator to every class. Do not write down the material and think "I will do it at home", there is no substitute for trying it at that moment, figuring out what you have problems with, and **ASKING A QUESTION!** (All questions are excellent, the only dumb questions are the ones that stay in your mouth.)
3. Read the book again.
4. As soon as lecture is over, try relevant HW problems. Get help as needed. Well before exam, try all HW, even ones not assigned for credit like the ones suggested at the end of each chapter, - the answers to all are posted so you can check.
5. Do all the worksheets. Not a "few", not "try" them, DO them, and get help as needed.
6. Read the book once more.
7. Do the practice exams- pretend they are real, and you have a short amount of time to finish. No notes, no help. And as soon as you can- this allows you to ask about where you had trouble.
8. Do NOT allow yourself to fall behind. If you think "I will catch up later" you are lying to yourself.
9. Review everything that you have done - HW, worksheets, problems during lecture, lab worksheets, and the book. We draw exam questions from multiple sources.
10. After each exam or quiz, look at the answer key (available from TA's) and figure out why you missed each problem. This will help you learn what to focus on for next exam.

(schedule on next page)

| <u>Date</u> | | <u>Lecture Schedule</u> | <u>Weekly Lab Schedule</u> |
|-------------|---------|--------------------------------------|--|
| Jan. | Wed. 21 | Introduction, Chapter 1 Chapter 1 | Lab begins Jan 26 (2nd week) |
| | Fri. 24 | | |
| | Mon. 26 | Chapter 1 | |
| | Wed. 28 | Chapter 1 | |
| | Fri. 30 | Chapter 2 | |
| Feb. | Mon. 2 | Chapter 2 | Check-in |
| | Wed. 4 | Chapter 2 | Experiment 1- Mass and Density |
| | Fri. 6 | Chapter 2 | |
| | Mon. 9 | Chapter 3 | Quiz 1 |
| | Wed. 11 | Chapter 3 | Do Periodic table worksheet |
| | Fri. 13 | Chapter 3 | |
| | Mon. 16 | Chap. 3 | Quiz 2 |
| | Wed. 18 | Chap. 3 | Chemical nomenclature worksheet |
| | Fri. 20 | Chapter 4 | |
| | Mon. 23 | Chapter 4 | |
| | Wed. 25 | Review for exam 1 | VSEPR worksheet |
| | Fri. 27 | Exam 1 (Chapters 1-3) | |
| Mar. | Mon. 2 | Chapter 4 | Experiment 4 -Separation of an unknown mixture |
| | Wed. 4 | Chapter 4 | |
| | Fri. 6 | Chapter 5 | |
| | Mon. 9 | Chapter 5 | Quiz 3, Experiment 5-Heat capacity of a metal |
| | Wed. 11 | Chapter 5 | |
| | Fri. 13 | Chapter 6 | |
| | Mon. 16 | Chapter 6 | Quiz 4, Experiment 25- determination of molar volume of gas and gas constant |
| | Wed. 18 | Chapter 6 | |
| | Fri. 20 | Chapter 6 | |
| | Mon. 23 | Chapter 7 | Experiment 8- metal carbonate |
| | Wed. 25 | Chapter 7 | |
| | Fri. 27 | Exam 2 (Chap 4-6) | |

| | | | |
|------|--|----------------------------------|--|
| | Mon. 30 | Spring break | |
| Apr. | Wed. 1 | Spring break | |
| | Fri. 3 | Spring break | |
| | Mon. 6 | Chapter 7 | Experiment 11-Empirical formula of Magnesium Oxide |
| | Wed. 8 | Chapter 7 | |
| | Fri. 10 | Chapter 8 | |
| | Mon. 13 | Chapter 8 | Quiz 5, Chemical reactions worksheet |
| | Wed. 15 | Chapter 8 | |
| | Fri. 17 | Chapter 9 | |
| | Mon. 20 | Chapter 9 | Quiz 6, Expt 27 part 1, Acid/base titrations |
| | Wed. 22 | Chapter 9 | |
| | Fri. 24 | Chapter 9 | |
| | Mon. 27 | Chapter 9 | Experiment 27- |
| | Wed. 29 | Chapter 9 | Continued from part 1 |
| May | Fri. 1 | Exam 3 (chap. 7,8,9) | |
| | Mon. 4 | Ch 10 | Check out of lab |
| | Wed. 6 | Ch 10 | |
| | Final Exam: Fri. May 8 th , 2015 1:00 - 3:00 pm | Final Exam is held in ENS 280 | The final exam is cumulative and therefore it will cover material from Chapters 1-10. |