

Chemistry 100
Introduction to General Chemistry
Spring 2019
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@sdsu.edu
<u>Laboratory Coordinator:</u>	Kathy McNamara Office: CSL 313 email: kmcnamara@sdsu.edu
<u>Course time:</u>	1:00-1:50 p.m., Monday, Wednesday, Friday, 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>	<p>Immediate Access-. Two of the required course materials for this class, Blei and Odian: Intro to General Chemistry 2nd edition, ISBN 9780738080710 and Denniston: Connect Access Code for General Organic and Biochemistry ISBN 9781259147500 are provided in a 365 day subscription digital format by the first day of classes and are free through Feb 5th at 11:59PM. After Feb 5th, your SDSU student account will be charged a special reduced price of \$78.00 for access to the content (see BB instructions for access) for the remainder of the fall semester unless you opt-out of the content by 11:59 PM on Feb 5th. To opt out visit: www.shopaztecs.com/optout . For more information visit: www.shopaztecs.com/immediateaccess for additional information about Immediate Access pricing, digital subscription duration, print add-ons, opting out and other frequently asked questions.</p> <p>If you are retaking this course from <u>last semester</u>, do NOT opt out. You will not have to pay again, they know if you are repeating. If you took it BEFORE last semester, you will need to pay again.</p> <p>Additionally, after the opt-out period ends and if you remain in the program, a reduced price print add-on will be available for \$25.50 at the SDSU Bookstore if you prefer print. For those opting out, you will need to procure digital and/or print materials at regular pricing through the bookstore or elsewhere.</p> <p>Can be substituted with used copies of ISBN 978-0716770732 or ISBN 978-0716743750 (first ten chapters only).</p>
<u>Lab Manual (required):</u>	<u>Chem 100 Lab Manual</u> , Chemistry Dept. Printed by Hayden MacNeil, Fall 2018

- i>clicker (required):** The i>clicker Personal Response Pad, also called a clicker, is purchased from the SDSU bookstore.
- Study aides (optional):** Study Guide for General, Organic, and Biochemistry, Second Edition (2006) M.L. Gillette & W. Gloffke
- Handout site** 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/>
- Text web site:** <http://www.whfreeman.com/>
- Blackboard web site:** <http://blackboard.sdsu.edu>
1) Combined sections: This syllabus and other handouts
2) Lab sections: Grades, announcements from your TA
- Additional required items:** **Non-programmable** calculator (e.g., TI-30Xa or Casio fx-300ms plus)
Matches or butane lighter for some lab exercises
Safety Glasses and apron (available at the Bookstore)
Gloves for some labs- molar volume of gas and titration experiments- strong acid or base will be used (available at drugstores such as CVS and Walgreens)

The course:

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

Prerequisites: Strong 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 CSL508 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 18 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 CSL508. 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 30 seconds 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 you 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. $67/100 \times 50$ possible points = 33.5 points total for clicker participation].

Statement on Cheating and Plagiarism: Academic honesty – **DO NOT** 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 10th, 2019 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.

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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 2019 semester is Tuesday, February 5th, 2019.

Students with Disabilities: At San Diego State we have an excellent Student Disability Services office (http://go.sdsu.edu/student_affairs/sds). If you are a student with a disability and believe you need special accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473 for an appointment. Do this as soon as possible to avoid any delay in the receipt of your accommodations. Please note that testing accommodations on the basis of disability are not retroactive and cannot be provided by the instructor without the student first obtaining an accommodation letter from Student Disability Services. Please make an appointment with Kathy to have SDS forms signed. Please also be aware that SDS has deadlines for submitting forms, if you do not meet their deadlines, no further accommodation will be offered.

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 approved eye protection, flame resistant (blue) lab coat or apron, pants or skirts that end below mid-calf, and closed-toe shoes. Long hair must be confined securely. The eye protection must be worn by everybody 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.

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 in which an "experiment" is scheduled in lab indicates you must wear long pants/skirts, goggles, and shoes in 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 an additional fee of \$25. If you need to drop CHEM100 during the semester, you must check out of your locker before a drop is allowed.

There are 10 participation points available. These will be assigned at the discretion of the lab TA at the end of the semester. Arriving on time and prepared for laboratory will insure that you receive these points.

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" sections are located in the back of each chapter of your textbook.

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 we highly recommend completion of all worksheets.

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, and checking out as assigned. Arriving on time and being prepared for every laboratory is **ABSOLUTELY** expected.

10 steps to Chem 100 success

1. Read the relevant chapter in the book **BEFORE** coming to the lecture that covers that chapter. The material may not be clear at that time, but you will have an idea of where the material is headed and that will help you understand concepts.
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", do not just "try" them, DO them, and get help as needed.
6. Read the book again (and again).

7. Do the practice exams- pretend they are real, as you have a short amount of time to finish (just 50 minutes). No notes, no help. Do the practice exams as soon as you can- this allows you to ask about where you are having 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 textbook. 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> Lab begins Jan 28 (2nd week)
Jan.	Wed.	23	Introduction, Chapter 1 Chapter 1	Lab begins Jan 28 (2nd week) Intro, lab tour Sig. Fig., scientific notation sheet Check-in Experiment 1- Mass and Density Quiz 1 Do Periodic table worksheet Quiz 2 Chemical nomenclature worksheet VSEPR worksheet Experiment 4 -Separation of an unknown mixture Quiz 3, Experiment 5-Heat capacity of a metal Quiz 4, Experiment 25- determination of molar volume of gas and gas constant Experiment 8- metal carbonate Experiment 11-Empirical formula of Magnesium Oxide Quiz 5, Chemical reactions worksheet
	Fri.	25		
Feb.	Mon.	28	Chapter 1	
	Wed.	30	Chapter 1	
	Fri.	1	Chapter 2	
	Mon.	4	Chapter 2	
	Wed.	6	Chapter 2	
Mar.	Fri.	8	Chapter 2	
	Mon.	11	Chapter 3	
	Wed.	13	Chapter 3	
	Fri.	15	Chapter 3	
	Mon.	18	Chapter 3	
Mar.	Wed.	20	Chapter 3	
	Fri.	22	Chapter 4	
	Mon.	25	Chapter 4	
	Wed.	27	Review for exam 1	
	Fri.	1	Exam 1 (Chapters 1-3)	
Apr.	Mon.	4	Chapter 4	
	Wed.	6	Chapter 4	
	Fri.	8	Chapter 5	
	Mon.	11	Chapter 5	
	Wed.	13	Chapter 5	
Apr.	Fri.	15	Chapter 6	
	Mon.	18	Chapter 6	
	Wed.	20	Chapter 6	
	Fri.	22	Chapter 6	
	Mon.	25	Chapter 7	
Apr.	Wed.	27	Chapter 7	
	Fri.	29	Exam 2 (Chap 4-6)	
	Mon.	1	Spring break	
	Wed.	3	Spring break	
	Fri.	5	Spring break	
Apr.	Mon.	8	Chapter 7	
	Wed.	10	Chapter 7	
	Fri.	12	Chapter 8	
	Mon.	15	Chapter 8	
	Wed.	17	Chapter 8	
Apr.	Fri.	19	Chapter 9	

	Mon. 22 Wed. 24 Fri. 26	Chapter 9 Chapter 9 Chapter 9	Quiz 6, Expt 27 part 1, Acid/base titrations
May	Mon. 29 Wed. 1 Fri. 3	Chapter 9 Chapter 9 Exam 3 (chap. 7,8,9)	Experiment 27- Continued from part 1
	Mon. 6 Wed. 8	Ch 10 Ch 10	Check out of lab
	Final Exam: Fri. May 10 th , 2019 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.