

## CHEM 2A INTRODUCTION TO CHEMISTRY Fall 2018

Total Number of Units: 5  
Hours of Lecture Per Week: 3

Prerequisite: Math 101  
Hours of Laboratory Per Week: 3

Hours of Discussion Per Week: 1

Course Instructor: Cliff Gottlieb, Phone: 530-242-2323. e-mail cgottlieb@shastacollege.edu  
web page: <http://www.cliffschemistry.com> and Shasta College Online.

Office Hours: Tues. 1:30 – 3:30 PM; Wed. 11 AM – 2:00 PM and at almost any time by appointment to meet your needs in 1412 or in the Science Learning Center, 1626. **Please come and visit;** lots of good stuff happens.

Catalog Course Description: This course is a survey of inorganic chemistry and some organic chemistry suitable for agriculture and nursing students. The basic fundamentals of the metric system, chemical nomenclature, atomic and molecular structure, chemical reactions, energy changes, states of matter, solutions, chemical equilibria and kinetics, and organic functional groups are presented. The quantitative nature of chemistry is developed by introduction of the Avogadro's number and the mole and continuing with stoichiometry, gas law, solution concentrations and pH calculations. The lecture/discussion portion of this course may be offered in a distance learning format.

Governing Principles: I TEACH STUDENTS FIRST with my vehicle being chemistry. I use a variety of techniques to provide the environment to help you learn about the information, thought processes, and methodologies used in all sciences, especially chemistry, which will allow you to succeed in this class and future classes. Practical applications will be emphasized. **YOU must WORK for your SUCCESS while we LEARN and have FUN. I will help you in any way that I can. NO FREAKING OUT!**

I look at higher education as something more than just asking you to regurgitate facts. I teach students as I do professionals in the private sector. I will illustrate processes of the mind emphasizing thinking and Life Long Learning. I will bring in current events and address relevant issues not in the text. I will show you how to find information on the Internet and how to discriminate the reliability of internet sites. I expect students to pay attention and ask thoughtful questions. I expect you to read the text and **especially my notes** online and do practice problems daily.

Student Learning Outcome: Students will be able to find and use information and data to solve problems and answer questions in chemistry.

Materials for the Class: (The text, the solutions manual, and other materials are available in the Science Learning Center.)

General, Organic, and Biological Chemistry, 7<sup>th</sup> ed. McMurry. Publisher: Prentice-Hall ISBN 0321750837

I will also accept the 5th, ISBN 0131877488, or 6th, ISBN 0136054501, editions as textbooks for the course.

Device to access internet using Wi-Fi. If you don't have one, please see me so we can make arrangements

Learning Catalytics: Register and pay for an account online. Details on the first day of class. Do not buy it at the bookstore!

Scientific Calculator: Not your cell phone! Avoid TI30XS Multiview and a TI89

Laboratory Manual for Chem 2A F-18, Gottlieb

Lab Safety Goggles – Must meet ANSI Standard 287.1 1989 (can be purchased from Science Club on 1<sup>st</sup> day of lab; about \$6)

Recommended but not required – Study Guide and Full Solutions Manual to the text, ISBN 0131877747

Lectures: Lectures are Mondays and Wednesdays. You are expected to attend lecture. If you miss 6 lectures you may be dropped from the class unless prior arrangements have been made. Come prepared to ask questions and otherwise participate in class. Participation using Wi-Fi enabled personal response device will count toward your grade and this cannot be made up if you are absent. I will suggest practice problems from the text. You will also be required to use the Shasta College Online program (Canvas), which will allow you access to course materials. I will help all of you to use this program. Graded homework will be done online using Canvas. You cannot make up homework.

Discussions: You must enroll and attend one of the 5 discussions connected to this class. These are the one that have Gottlieb listed as the instructor and they are: M 11- 11:50 room 1414, M 12:30 – 1:20 room 1415, M 2:00 – 3:00 room 1415, T 8:30 – 9:20 room 1414, and T 12:30 – 1:20 room 1415. Each week you must attend one discussion section. During that time, I will answer any of your questions and provide you with more practice problems. At the end of each discussion, there will be a 10-point quiz over the previous week's material. Please attend a different discussion section if you cannot make your regular discussion section. You don't need my permission but just tell me in discussion. If you miss all discussion sections, you cannot make up that week's quiz

Labs: You must attend and do not come late!! You will need safety goggles and the lab manual. All lab entries must be in blue or black ink or pencil. Every lab will require an individual report which you will submit at the end of lab period. In your submissions you must clearly record and communicate data and your answers. No late labs will be accepted without prior approval. **You must pass lab to pass the class.** You are responsible for knowing and following the safety rules and acting in a safe manner at all times. VIOLATION OF SAFETY RULES WILL LEAD TO EXPULSION FROM THE CLASS. If you are not sure, **ASK**. Due to lack of space, equipment, and time, make up labs are not permitted. Some labs may end early but do not plan to leave early.

**Missed labs are graded as a zero.** If you cannot attend your scheduled lab, you may attend another lab section. If you attend a different lab section, have that lab instructor initial your lab and turn it in to your regular lab instructor. Lab times are: M 2 – 4:50, T 9:30 – 12:20, T 2 – 4:50, W 2 – 4:50, and Th 9 – 11:50. All are in room 1414.

**Lab Evaluation:** Lab reports typically will be worth 10 points each. Errors, omissions or lower quality work will receive lower grades in 0.5 point increments. Up to 50% of the total lab points may be deducted based on your legibility of your lab report, behavior, participation, ability to follow directions, and acting in a safe and professional manner. All labs are due at the end of the lab period. **All cell phones, tablets and laptops must be turned off unless you have specific permission from your instructor.**

**Methods of Evaluation/Grading Scale:** Each of you has the innate ability to earn an "A". I hope that each of you will **work to achieve an "A"!! All work must be done in black or blue ink or grey pencil!! I recommend pencil.**

1. 400 points for exams. Four exams are 100 points each and each might have some extra credit. ☺
2. 100 points for Quizzes. Quizzes will count 10 points each. You will have 12 quizzes given in the weekly discussion sections. It is possible to earn up to 120 points out of 100 points possible This is like having the opportunity to earn 20 "extra credit" points.
3. 65 points for homework at 5 points per chapter. Homework will be done using the Shasta College Online program
4. 90 points for Classroom participation using Learning Catalytics. Typically, 2 to 6 points per lecture. No make-up allowed under any circumstances. <u>No open notes.</u> You will have the opportunity to earn at least 105 points so there will be at least 15 extra points possible. Take your total points shown on Learning Catalytics and divide them by 2 to get your classroom participation points. (Each question is worth ½ point but Learning Catalytics does not do fractions.) You must physically be in the classroom or you will lose ALL of your Learning Catalytics Points for the semester.
5. 100 points for Lab. It is the <u>average</u> percent of your lab scores NOT the sum of your lab scores.
6. With reasonable notice, I reserve the right to modify or create other assignments or requirements that I deem necessary

**Course grades are based on the total points that you earn not by percent.** There are 755 points in the course with the opportunity to earn at least 790 points with the extra credit (that is over 4% extra credit) outlined above. There is **no credit other than outlined above. DO NOT ASK!** BECAUSE OF ALL THE AVAILABLE EXTRA CREDIT, THESE POINT VALUES WILL NOT BE DEVIATED EVEN BY ONE POINT! Course Grades: A ≥ 679 points; B = 604 – 678; C = 528 – 604; D = 453 – 528; F < 453.

**No make-up or LATE exams, quizzes, or homework are allowed unless you have immediate family or personal health or legal emergencies.** Call me as soon as possible, typically the same day, to notify me of your emergency. If you have health, legal, or sports non-emergencies, you may be able to make arrangements to take an exam, quiz or submit homework early. You must contact me at least one week prior to make arrangements.

**I do not drop exams. You are responsible for keeping track of your own points. I have provided a spreadsheet on Canvas that you can download and can enter all of your grades and it will keep track of your total points. DO NOT ASK ME WHAT YOUR GRADE IS!!** Or I will deduct 10 points from your course total. That spread sheet gives you your current percent at any time.

**Keep all graded work.** If you have any corrections or grade questions about any graded material, you must notify me within one calendar week after the material is returned to the class. No adjustments in grades will be made after this time. I reserve the right to create grading policies to cope with atypical situations. Finally, you probably are aware that only you can get your education--no professor can give you an education. **You are responsible for yourself.** I am responsible to help you help yourself. Your success in this class is a reflection of your effort.

**I will help you in any way that I can. Please communicate with me any issue or situation no matter how small so I may help you! Communicate early and often. And one more thing: NO FREAKING OUT!!**

**CLASSROOM BEHAVIOR/ETIQUETTE:** Come to class on time. In class do not socialize, talk, or engage in any behavior that is unrelated to or distracting from the class. If you must leave class early, notify me at the beginning of class, sit near the door, and exit quietly. This is a college classroom and you are expected to behave like adults who wish to learn. When we are not using Learning Catalytics, **ALL CELL PHONES, TABLETS AND LAPTOPS MUST BE TURNED OFF.** The class will be **warned with a YELLOW CARD** regarding any inappropriate behavior. After that individuals or the entire class gets a **RED CARD.** A Red Card means you are ejected from the class and lose 10 points off your grade. For subsequent RED CARDS, the point deduction doubles each time and you will have to schedule a conference with me before you can return to class.

**ACADEMIC HONESTY:** I will not tolerate cheating which I define to include the one who knowingly gives as well as the one who receives. All work is to be done and submitted individually unless I explicitly say differently. If you cheat, you will receive a 0 for the work involved and a penalty fine of a 50 point deduction from your grade. If you have concerns regarding academic honesty, or any aspect of cheating, please see me. In lab you may work together in groups but you must submit your own individual lab report.

**CLASS COMMUNICATIONS:** USE the e-mail function of **Canvas** to communicate personally with me. For general class communications, you can use the Canvas discussion board, "ask Cliff questions here". In case of emergency, let me know using Canvas e-mail immediately or you can call me at my office (242-2323). Do **not use my general e-mail @shastacollege.edu!** **IMPORTANT!!!!** Using Canvas e-mail: USE THE INBOX LINK TO SEND ME E-MAIL!!!! Here is how. Click on the inbox, at the top middle of the page you will see a leaf icon. Click on it and choose Chem 2A. At the far right of the "To:" Box you will see a person icon. Click it and choose your recipient then type away. PLEASE DON'T USE THE HELP LINK TO SEND E-MAIL.  
**I will help you in any way that I can Communicate early and often. NO FREAKING OUT!!**

**OTHER RESOURCES:** **Science Learning Center. It has tutors and other resources available. Information on page 5.**

**Academic accommodations imposed by a disability:** Academic adjustments due to a disability or serious medical condition: Students should contact the office of Partners in Access to College Education (PACE) for authorization of academic adjustments (accommodations) for this course. The office is located in room 2006 (242-7790). Students will need to provide documentation that verifies the condition and the type of limitations that may result. The staff in PACE have been designated with the authority to 1) evaluate that documentation, 2) determine which academic adjustments are appropriate to this course, and 3) facilitate the provision of approved academic adjustments. Students will submit notices directly to the course instructor regarding specific academic adjustments that are authorized for this class.

**Full Non-Discrimination Statement**

The Shasta-Tehama Trinity Joint Community College District ("Shasta College") does not discriminate against any person on the basis of race, color, national origin, sex, religious preference, age, disability (physical and mental), pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), gender identity, sexual orientation, genetics, military or veteran status or any other characteristic protected by applicable law in admission and access to, or treatment in employment, educational programs or activities at any of its campuses. Shasta College also prohibits harassment on any of these bases, including sexual harassment, as well as sexual assault, domestic violence, dating violence, and stalking.

Gregory Smith, Associate Vice President of Human Resources, (530) 242-7649, [gsmith@shastacollege.edu](mailto:gsmith@shastacollege.edu)

Sandra Hamilton Slane, Associate Dean of Students, (530) 242-7799, [sslane@shastacollege.edu](mailto:sslane@shastacollege.edu)

**Tentative Lecture and Lab Schedule: I reserve the right to modify this schedule as I deem necessary.**

Week Starting	Chapter schedule for 5 <sup>th</sup> and 6 <sup>th</sup> ed	Chapter schedule for 7 <sup>th</sup> ed	Do all in Chapter problems and Suggested End of Chapter Problems (evens) for 5 <sup>th</sup> & 6 <sup>th</sup> ed	Do all in Chapter problems and Suggested End of Chapter Problems (evens) for 7 <sup>th</sup> ed	Lab Activity
8/20	1 & 2	1	Ch 1 16 – 50; 54 - 62	Ch 1 38 -106	Safety.
8/27	2 & 3	1 & 2	Ch 2 26 – 106	Ch 2 30 - 50; 54 - 92, 102	Lab 1
9/4	3 & 4	2 & 3	Ch 3 28 – 54; 60 – 96 (for 86 give dots), 110	Ch 3 32 - 96	Lab 2 No M lab
9/10	4	3	Ch 4 32 – 98		Lab 3 M lab 2 & 3
9/17	Exam 1 (9/19)	Exam 1	Exam 1 (9/19) covers Chap.1-4	Exam 1 covers Chap. 1-3	Lab 4
9/24	5 & 6	4 & 5	Ch 5 28 - 34; 38,40, 48 - 58; 60c, 62 – 66; 70 -74; 78 - 98; 104 – 110	Ch 4 28 – 32; 38; 46 – 56; 58c; 60 – 64; 68 – 72; 76 – 96; 102 – 108. Ch 5 20 – 46; 46; 54 – 58; 64 – 70; 72a,b	Lab 5
10/1	6	5 & 6	Ch 6 28 – 82, 88 – 98, 102	Ch 6 18 – 56; 60 – 64; 68 - 76	Lab 6
10/8	7	6 & 7	Ch 7 18 – 52, 62, 68 – 78	Ch 7 20 – 52; 62; 68 - 78	Lab 7
10/15	Exam 2 (10/17)	Exam 2	Exam 2 (10/17) Chapters 5 - 7	Exam 2 Chapters 4 – 7	Lab 8
10/22	8	8	Ch 8 22 – 110, 116	Ch 8 31 – 104, 116	Lab 10
10/29	8 & 9	8 & 9	Ch 9 32 – 106	Ch 9 32 – 104	Lab 11
11/5	9 & 10	9 & 10	Ch 10 32 – 52, 58, 64 – 76, 82, 86 – 90, 98 – 104	Ch 10 34 – 52, 58, 62 – 74, 80, 84 – 88, 96 – 104	Lab 12
11/12	Exam 3 (11/14)	Exam 3(11/14)	Exam 3 covers Chapters 8 – 10(except 10.15)	Exam 3 covers Chapters 8 – 10(except 10.13)	Lab 9
11/26	10.15 & 11	10.13 & 11	Ch 10 92, 94 & 106 Ch 11 18 – 64, 68 – 78, 68 – 78, 82-86	Ch 10 90, 92 & 106 Ch 11 22 – 64, 68 – 80, 84 – 88	Lab 13
12/3	12	12	Ch 12 18 – 72	Ch 12 20 – 72	Lab 14
12/10	12 & 13	12 & 13	Ch 13 24 – 86	Ch 13 24 – 90	Lab 15
12/17	Exam 4	Exam 4	Exam 4 covers chapters 10.15; 11 – 13	Exam 4 covers chapters 10.13; 11 – 13	Check out

Course Objectives: Upon completion of this a student should be able to:

1. Describe the methods science uses to investigate the universe
2. Name the different metric units and give the numerical meaning to metric prefixes
3. Name the instruments used for measuring and know the number of significant figures each yields
4. Recognize sources of errors in measurement
5. Explain accuracy and precision in measurements
6. Use scientific notation correctly
7. Convert between different units given conversion factors
8. Use density = mass/volume in calculations
9. Use the correct number of significant figures in calculations
10. Identify the names and symbols for the first 30 and other selected elements
11. Identify the mass and atomic number for elements on the periodic table
12. Give the mass and atomic number for given isotopes
13. Identify the structure of the nucleus
14. Identify energy levels for electrons and relate them to the periodic table
15. Define and recognize radioactive isotopes
16. List the types of radiation and give their characteristics
17. Balance nuclear equations
18. Define the concept of half-life and use it in calculations
19. Identify at least two applications of radiation
20. Define, recognize, and give an example of nuclear fission and fusion
21. Identify the number of valence electrons for elements by using the periodic table.
22. Predict charges on main group ions.
23. Use chart to recognize polyatomic ions
24. Name and write formulas for ionic compounds
25. Name and write formulas for molecular inorganic compounds.
26. Draw dot structures of molecular compounds
27. Predict shapes of molecular compounds by using chart.
28. Define a covalent bonds and recognize polar and nonpolar bonds
29. Identify compounds as ionic, polar covalent, or nonpolar covalent
30. Identify the direction of heat transfer between substances.
31. Define calorie, kilocalorie, nutritional Calorie and Joule
32. Calculate the amount of heat energy transferred given mass, specific heat, and change in temperature
33. Describe the different states of matter from a molecular view
34. Recognize and describe dipole-dipole, hydrogen bonds, and dispersion forces
35. Describe how heat energy causes phase changes from a molecular view
36. Apply energy concepts of nutrition and global temperature change
37. Recognize from observation when a chemical reaction occurs
38. Write balanced chemical equations that describe chemical reactions
39. Classify chemical reactions
40. Define endothermic, exothermic, and activation energy
41. Define the factors that affect the rate of a chemical reaction
42. Describe the concept of chemical equilibrium
43. Define a mole
44. Perform calculations involving moles, grams and number of atoms or molecules
45. Relate the mole to chemical formulas
46. Calculate the percent composition of a substance from a formula
47. Perform stoichiometric calculations
48. Describe the theory of gases
49. Calculate P, V, T or n using gas law relationships or the ideal gas law
50. Describe the meaning of partial pressures and relate it to the mechanism of breathing
51. Describe the unique properties of water
52. Describe how a solute dissolves in water from a molecular basis
53. Describe the meaning of the solubility phrase, "like dissolves like"
54. Calculate the molarity and percent concentration of solutions
55. Calculate ionic equivalents
56. Perform dilution calculations and dilutions
57. Describe a colloid and give at least two examples
58. Define osmotic pressure, hypertonic, hypotonic, and isotonic and use in applications
59. Define and recognize acids and bases, strong and weak
60. Define salts and recognize acidic, basic and neutral salts
61. Calculate pH from hydronium ion concentration and vice versa
62. Calculate hydroxide ion concentration given pH or hydronium ion concentration
63. Perform acid/base stoichiometry calculations
64. Define and describe a buffer solution and buffer capacity
65. Define and recognize organic compounds
66. Recognize and name functional groups
67. Name and draw structures for alkanes
68. Recognize constitutional isomers
69. Recognize and give the products for the reactions of alkanes
70. Describe the principles of the distillation of crude oil
71. Name alkenes
72. Recognize and give the products of the reactions of alkenes

**SCIENCE LEARNING CENTER**  
Redding Campus, Life Science Building - 1600  
Room 1626 530.242.2325  
Margaret Savage, SLC Coordinator  
[www.shastacollege.edu/ScienceLearningCenter](http://www.shastacollege.edu/ScienceLearningCenter)

The Science Learning Center provides a supportive learning environment where students can realize their educational goals. The Science Learning Center offers a comfortable study environment where students can study individually or in small groups. In addition, free tutoring and a variety of other resources are available to assist students enrolled in science courses. Resources are available for use in the Science Learning Center. A driver's license or Shasta College ID card is required to check-out most resources.

**Free Tutoring:** Free Tutoring is offered by students who have successfully completed the courses they tutor with a "B" or better grade. In addition to clarifying any confusing concepts, tutors can recommend good study techniques and organizational skills to help you maximize your study time. A tutoring schedule is posted in the Science Learning Center.

**Additional Resources:**

- **Text books:** Current text books, as well as solution manuals are available for most courses. In addition, various references books are available.
- **Calculators:** Basic scientific calculators and graphing calculators are available for use.
- **Microscopes and slides:** Microscopes and slides are available for reviewing some lab material.
- **CD's/DVD's:** CD's/DVD's are available on various science topics.
- **Computers:** Four internet connected computers with Microsoft Office suite installed are available for use. In addition, two laptop computers are available for in room use. Printing is available for 10 cents/page.
- **Copy Machine:** A copy machine is available in the Science Learning Center. Copies are 10 cents/page.
- **Office Supplies:** Various office supplies and office equipment are available for use (paper cutter, staplers, scissors, tape, hole puncher, markers, colored pencils, etc.).
- **Study Room:** A small study room is available for quiet study.

The Science Learning Center is a friendly, helpful, encouraging environment, which could become your home away from home. Stop by and check out the Science Learning Center.

**ADDING A CLASS**

Students may add a full-term class through the fourth week of the term.\* After the first two class meetings, approval of the instructor is required to add the class, which includes both the signature of the instructor and the first date of attendance. **IT IS THE STUDENT'S RESPONSIBILITY** to pick up the form from the Admissions and Records Office and take it to the instructor for approval. The student must then return the form to the Admissions and Records Office or Extended Education Center for processing before the add is finalized.

**DROPPING A CLASS WITHOUT RECORD**

Students may drop a class, and have no notation appear on their transcripts, through the fourth week\* or 30% of the term for classes less than a semester in length. **IT IS THE STUDENT'S RESPONSIBILITY TO DROP CLASS (ES).** The necessary forms are available from Admissions and Records, Extended Education Centers, or by mail. If a student intends to drop a class and stops attending but fails to file the necessary forms, a failing letter grade may be assigned by the instructor.

**WITHDRAWING FROM A CLASS WITH A "W" GRADE**

Students may withdraw from a class after the official "drop" date and up through the fourteenth week or 75% of the term for classes less than a semester in length. The notation "W's" will appear on the student's transcript and will not be used in calculations of grade point average. Excessive "W" shall, however, be used as factors in probation and dismissal procedures. **IT IS THE STUDENT'S RESPONSIBILITY TO OBTAIN FORMS AND SUBMIT THE NECESSARY PAPERWORK TO WITHDRAW FROM A CLASS.** Forms are available from Admissions and Records, Extended Education Centers, or by mail. Students who have not dropped or withdrawn from a class before the end of the fourteenth week or 75% of the term will be assigned a course grade.

**ATTENDANCE**

Students are expected to attend all class meetings. A student who fails to attend the first meeting of a course without notifying the instructor may be dropped from the class. In addition, an instructor may drop a student during the first 30% of the term for excessive absences. Nevertheless, **IT IS ALWAYS THE STUDENT'S RESPONSIBILITY TO OFFICIALLY DROP OR WITHDRAW** from the class. Students who fail to file the necessary forms, even though they stop attending class