

**SHASTA COLLEGE**

**Science, Language, Arts, and Math**

**Chem 2A, Face-to-Face**

**Liquid Syllabus**

**FIRST CLASS HANDOUT – Spring 2023:**

CHEM 2A – INTRODUCTION TO CHEMISTRY

Number of Units: 5

Prerequisite: High School Algebra

Course Instructor: [Dr. Divan Fard](#)



[\(493\) Chem 2A Intro video spring 2023 - YouTube](#)

E-mail: [dfard@shastacollege.edu](mailto:dfard@shastacollege.edu)

**Office Hours:**

Monday: 9:00-9:25 AM & 1:00-1:50 PM

Tuesday: 1:00-1:50 PM

Wednesday: 9:00-9:25 AM, 11:00-11:50 AM & 1:00-1:50 PM



He had to post his office hours,  
but he didn't have to tell anyone where.

**How do I see my instructor during office hours?**

Please see me at my office, 1406

**My Expectation from You and What You Can Expect from Me:**

<b>Here's what you can expect from me.</b>	<b>Here's what I will expect from you.</b>
<p>1. I will be actively present in your learning. I will participate in course learning, discussions, Labs, and doing assignments. I will be ready to help you understand the difficult concepts during my office hours</p>	<p>1. Attend all scheduled classes and your independent team study group meetings.</p>
<p>2. I will be responsive to your needs. I will respond to your inquiries within 24 hours.</p>	<p>2. Every week you receive a list of assignments that will give you seven days to complete. Please manage your time to do them throughout the week so you do not have to do them at the last moment</p>
<p>3. I will review assignments within 72 hours of the due date and inform you by sending you the feedback and corrections.</p>	<p>3. Study and understand all material, never do an assignment before fully understanding the concepts. If you do not understand them, get help from:</p> <p>a. your team members</p>

	<p>b. attend SI classes and ask</p> <p>c. come to my office hours</p> <p>d. makes an appointment with SLC tutors</p> <p>e. ask your question in Canvas Q&amp;A Discussion to have other students answer your questions (for extra points to respondents)</p> <p>e. search Google, and YouTube for the key concepts you are not understanding.</p>
4. I will be flexible to support your individual needs as best I can.	4. To earn a digital badge for this course, you will answer questions of other students on Canvas Q&A Discussion. You will get extra points for each badge you earn.
5. I will always be open to your suggestions to improve this course and serve you better.	5. If you have ideas to improve this course, go ahead and share them with me. I will give you a badge if your idea could improve the course.

**How do I get access to MyShasta, Canvas, Office 365, Campus Logic, iGrad and other systems**



Shasta College utilizes a central login portal for password management service and provides access for students and staff to MyShasta, Canvas, Office 365, Campus Logic, iGrad and other systems. You will need log in access to use the Shasta College Student Portal. If you don't have one yet, please send email to: [admissions@shastacollege.edu](mailto:admissions@shastacollege.edu), or call admissions at (530) 242-7650.

**How do I get access to Canvas?**

If you are a new student and do not know how to get to your Canvas page, please click <https://www.shastacollege.edu/search/?q=new+students+and+Canvas%3F>

If you run into any Technology problem, you can go to: [Request Technology Support | Shasta College](#)

If you had Canvas issues and need help you can go to: [Canvas Help Support for Students | Shasta College](#)

### Where is Tutoring and Learning Center?



Got questions? The tutoring center is here to **help**. · E-mail – [TLC@shastacollege.edu](mailto:TLC@shastacollege.edu) · **STEM Learning Center** – (530) 242-7785 · is open for both in-person and online appointments. They have locations at the Redding Main Campus, Tehama Campus, Trinity Campus, and Intermountain Campus. They offer **FREE** peer tutoring for a broad spectrum of courses in Math, Business, Science, canvas, or any classes that require Writing assignments (like essays, speeches, or papers).

Also, this center will assign a supplemental learning classis taught by the SI staff. You will receive the schedule by email, after the first week of classes.

### COURSE DESCRIPTION

Chemistry plays a pervasive role in all our lives. Hundreds of materials that you and your family use directly and indirectly every day are products of chemical research. The development of pharmaceuticals, plastics, (nylon, polyethylene, Formica, Saran, Teflon, Hollofil, Gore-Tex, Polyester, silicone, etc.), fertilizers, computer chips, paper, and wood products are results of chemical studies.

In this course you will see a survey of principles of inorganic chemistry suitable for agriculture allied health, and especially for nursing students.

Upon successful completion of this course, students will be able to:

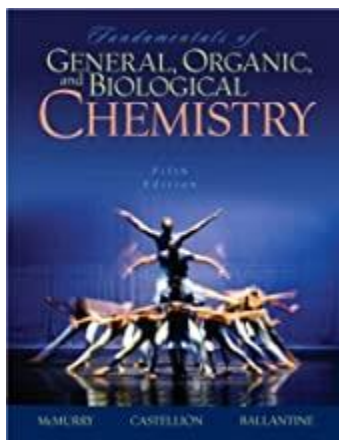
1. Demonstrate an understanding of atomic structure; the way atoms combine to form a molecule, stoichiometry of a chemical reaction, heat transfer in a chemical reaction, states of matter under different conditions, interactions between molecules, and shapes of different molecules.
2. Apply the above principles in solving problems.

3. Conduct laboratory experiments, which will enable students to develop skills necessary for experiments in an inorganic lab and to develop an appreciation for the basic principles of chemistry.

### **Student Learning Outcomes**

Upon successful completion of the course, a student should be able to collect and analyze data in the lab. Synthesize chemical concepts and use the scientific method to propose reasonable solutions to chemical problems

### **REQUIRED MATERIAL:**



**Fundamentals of General, Organic and Biochemistry, McMurry and Castellion, Prentice Hall; 5th edition ISBN: 0131877488**

**Every student must acquire a scientific calculator.**

**Every student must acquire a pair of goggles to wear during the labs:**



### **Suggested learning guideline**

Chemistry 2A students will attend Face-to-Face classes, Discussion classes and Laboratory. They will also do Homework, Discussions quizzes, prepare lab reports. Students are required to study the concepts from the book, and slides before doing any of the assignments. All students will be given only one chance to do their Homework, Discussions quizzes, Lab quizzes, and Exams.

1. The instructor will use PowerPoint slides, whiteboards, computer animations, and videos. Students are required to study the theoretical considerations of every experiment and understand the objectives of the experiments. For every experiment, there is one or more data and several questions. Data is to be filled out or recorded, questions must be answered, and your lab report must be uploaded to Canvas at the end of the laboratory period.
2. Synchronizing lectures with labs has always been a problem in chemistry courses, and sometimes lectures and labs may not correlate exactly with one another. This is because it is often not possible to keep up the pace of topic changes in the lab. Please make sure to look up the concepts and the theories that may be needed for you to understand the lab.

### **Course Schedule/Calendar:**

There will be one exam, every 4 weeks, for every three chapters, and a final exam, which is cumulative and covers 12 chapters.

### **Exam & Quizzes**

Students will be given a table of information on Canvas to use. To protect the comprehensive learning integrity, and fairness to all, Students who miss an exam or a quiz, during the permitted period will get zero on those. Under extenuating circumstances, they could only replace their missing score with the final exam score only if their excuse is acceptable.

EVALUATION PROCEDURE:

The following components make up the mark for this course:

Topic	Percent
Homework	5%
Discussions	5%
The first test (Chs 2, 3, & 4)	15%
Second test (Chs: 5,6 &7)	15%
The third test (Chs; 8, 9, 10)	15%
Final Exam (cumulative Chs: (2,3,4,5,6,7,8,9,10,11, &12)	35%
Laboratory Reports	10%

**No makeup for exams permitted, late lab reports are not acceptable.**

GRADING SYSTEM:

90 – 100 %    A

80 – 89 %    B

70 – 79 %    C

60 – 69 %    D

59-lower    F

**Student's Right of Confidentiality and Privacy**

Students have the right to confidentiality and privacy.

COURSE UNITS:

1. (Ch. 2)
2. (Ch. 3)
3. (Ch. 4)
4. (Ch. 5)
5. (Ch. 6)
6. (Ch. 7)
7. (Ch. 8)
8. (Ch. 9)
9. (Ch. 10)
10. (Ch. 11)
11. (Ch. 12)

Attention: The contents of chapter one will be included in chapters 2-8.

### **LABORATORY SCHEDULE**

Introduction to Canvas

**First lab:** Safety Rules, Equipment, check in & quiz

Lab 1: Temperature of a Bunsen burner Flame

Lab 2: Paper Chromatography

Lab 3: Measurement

Lab 4: Atoms

Lab 5: Flame Test

Lab 6: Lewis Structure Molecules

Lab 7: Empirical Formula

Lab 8: Chemical Reactions

Lab 9b: Percent of Oxygen in  $\text{KClO}_3$

Lab 10: Gas laws

Lab 11.1: Solutions

Lab 12: Acids & Bases

Lab 13: Determination of Acid Content in Vinegar

Lab 15: Hydrocarbons, and Check Out



## **Lab Reports:**

The laboratory meets once a week (3 hrs.). Students are required, before attending the lab, to study the theoretical considerations of every experiment and understand the objectives of the experiments.

For every experiment there is one or more data and several question sections. Data are to be filled out or recorded as you are performing the experiments. Questions must be completed by getting together with your partner/s, discussing all the observation, and coming up with proper explanations. Every team will come up with one lab report to upload to Canvas and partners will get the same grade. Team members should take turns in uploading the joint lab reports.

## **Components of Lab Report**

Title Page

1. The title of the experiment.
2. Your name and the names of any lab partners.
3. Your instructor's name.
4. The date report was submitted.

### **Title**

The title says what you did. It should be brief (aim for ten words or less) and describe the main point of the experiment or investigation. An example of a title would be: "Effects of Ultraviolet Light on Borax Crystal Growth Rate".

### **Introduction or Purpose**

Usually, the introduction is one paragraph that explains the objectives or purpose of the lab. In one sentence, state the hypothesis. Sometimes an introduction may contain background information, briefly summarize how the experiment was performed, state the findings of the experiment, and list the conclusions of the investigation. Even if you don't write a whole introduction, you need to state the purpose of the experiment, or why you did it. This would be where you state your hypothesis.

### **Materials**

List everything needed to complete your experiment.

### **Methods**

Describe the steps you took during your investigation. This is your procedure. Be sufficiently detailed that anyone could read this section and duplicate your experiment. Write it as if you

were giving directions for someone else to do the lab. It may be helpful to provide a figure to diagram your experimental setup.

### **Data**

Numerical data obtained from your procedure is usually presented as a table. Data encompasses what you recorded when you watched the video. It's just the facts, not any interpretation of what they mean.

### **Results**

Describe in words what the data means. Sometimes the Results section is combined with the Discussion.

### **Discussion or Analysis**

The Data section contains numbers; the Analysis section contains any calculations you made based on those numbers. This is where you interpret the data and determine whether or not a hypothesis was accepted. This is also where you would discuss any mistakes you might have made while conducting the investigation.

### **Conclusions**

Most of the time the conclusion is a single paragraph that sums up what happened in the experiment, whether your hypothesis was accepted or rejected, and what this means.

### **Figures and Graphs**

Graphs and figures must both be labeled with a descriptive title. Label the axes on a graph, being sure to include units of measurement. The independent variable is on the X-axis, the dependent variable (the one you are measuring) is on the Y-axis. Be sure to refer to figures and graphs in the text of your report: the first figure is Figure 1, the second figure is Figure 2, etc.

### **References**

If your research was based on someone else's work or if you cited facts that require documentation, then you should list these references.

### **Points of each section of the Lab Report**

<b>Key Elements</b>	<b>Exceed</b>	<b>Achieve</b>	<b>Approaches</b>	<b>Fail to meet</b>
The title of the experiment.	2	1.5	1	0
Your name and the names of any lab partners.	2	1.5	1	0
Your instructor's name.	2	1.5	1	0

The date report was submitted.	2	1.5	1	0
Name of the Experiment	5	4	3	0
Purpose of the experiment	5	4	3	0
Material used	5	4	3	0
Methods used	5	4	3	0
Data Collected	10	8	7	0
Interpretation of the Data	10	8	7	0
Calculations	20	18	15	0
Conclusion	10	8	7	0
Figures and graphs	20	18	15	0
References	2	1.5	1	0

### **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 yield
4. Use scientific notation correctly
5. Convert between different units given conversion factors
6. Use density = mass/volume in calculations
7. Use the correct number of significant figures in calculations.
8. Know the names and symbols for the first 30 and other selected elements
9. Identify the mass and atomic number for elements on the periodic table
10. Give the mass and atomic number for given isotopes
11. Identify the structure of the nucleus
12. Identify energy levels for electrons and relate them to the periodic table
13. Define and recognize radioactive isotopes
14. List the types of radiation and give their characteristics
15. Balance nuclear equations
16. Define the concept of half-life and use it in calculations
17. Identify at least two applications of radiation
18. Define, recognize, and give an example of nuclear fission and fusion
19. Using the periodic table identifies the number of valence electrons for elements
20. Predict charges on main group ions.
21. Use the chart to recognize polyatomic ions

22. Name and write formulas for ionic compounds
23. Name and write formulas for molecular inorganic compounds.
24. Draw dot structures of molecular compounds.
25. Using the chart, predict shapes of molecular compounds
26. Define covalent bonds and recognize polar and nonpolar bonds
27. Identify compounds as ionic, polar covalent, or nonpolar covalent
28. Identify the direction of heat transfer between substances.
29. Define calorie, kilocalorie, nutritional Calorie and Joule
30. Calculate the amount of heat energy transferred given mass, specific heat, and change in temperature
31. Describe the different states of matter from a molecular view
32. Recognize and describe dipole-dipole, hydrogen bonds, and dispersion forces
33. Describe how heat energy causes phase changes from a molecular view
34. Apply energy concepts of nutrition and global temperature change
35. Recognize from observation when a chemical reaction occurs
36. Write balanced chemical equations that describe chemical reactions
37. Classify chemical reactions
38. Define endothermic, exothermic, and activation energy
39. Define the factors that affect the rate of a chemical reaction
40. Describe the concept of chemical equilibrium
41. Define a mole
42. Perform calculations involving moles, grams, and number of atoms or molecules
43. Relate the mole to chemical formulas
44. From a formula, calculate the percent composition of a substance
45. Perform stoichiometric calculations
46. Describe the theory of gases
47. Calculate P, V, T or n using gas law relationships or the ideal gas law
48. Describe the meaning of partial pressures and relate it to the workings of breathing
49. Describe the unique properties of water
50. Describe how a solute dissolves in water from a molecular basis
51. Describe the meaning of the solubility phrase, "like dissolves like"
52. Calculate the molarity and percent concentration of solutions
53. Calculate ionic equivalents
54. Perform dilution calculations and dilutions
55. Describe a colloid and give at least two examples
56. Define osmotic pressure, hypertonic, hypotonic, and isotonic and use in applications
57. Define and recognize acids and bases, strong and weak
58. Define salts and recognize acidic, basic, and neutral salts
59. Calculate pH from hydronium ion concentration and vice versa
60. Calculate hydroxide ion concentration given pH or hydronium ion concentration
61. Perform acid/base stoichiometry calculations
62. Define and describe a buffer solution and buffer capacity
63. Define and recognize organic compounds
64. Recognize and name functional groups
65. Name and draw structures for alkanes
66. Recognize constitutional isomers
67. Recognize and give the products for the reactions of alkanes
68. Describe the principles of the distillation of crude oil

69. Name alkenes, recognize and give the products of the reactions of alkenes

### **ACADEMIC HONESTY POLICY**

Academic dishonesty is the willful and intentional fraud and deception for the purpose of improving a grade or obtaining course credit and includes all student behavior intended to gain or provide an unearned academic advantage by fraudulent and/or deceptive means. The student has full responsibility for the content and integrity of all academic work submitted. Ignorance of a rule does not constitute a basis for waiving the rule or the consequences of that rule. Students unclear about a specific situation should ask their instructor, who will explain what is and is not acceptable in their classes. Violation of this policy will result in appropriate disciplinary action." Examples of such unauthorized behavior include but are not limited to: taking information, providing information, and plagiarism.

**Other cheating examples are defined as:**

1. We are receiving aid during an exam from anyone other than the instructor.
2. Using unauthorized materials during the exam.
3. Giving unauthorized aid to a student taking an exam.

The penalty for cheating is an "F" on that exam or immediate dismissal from the class.

### **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 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**

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*