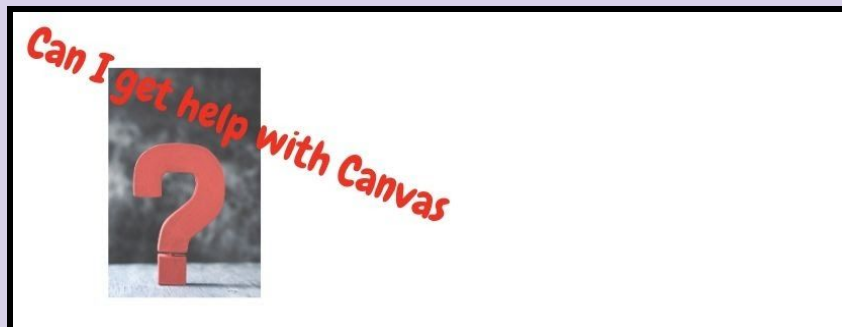


CHEM1A - GENERAL CHEMISTRY 1A SYLLABUS**A. INTRODUCTION:**

- **Instructor:** Burcak Artun, PhD (artunburcak@fhda.edu)
- **Course Website:** Canvas



- **Location & Times:**
Lecture: Tue/Thu 12:00pm-1:15pm, (section 03 & 04)
Lab: Tue/Thu 7:30am-10:20am, section 03
Tue/Thu 2:30pm-5:20pm, section 04
- **Office Hours:** Tue/Thu 10:30pm-11:30pm, 1:30pm-2:30pm,

B. STUDENT RESOURCES FOR ONLINE LEARNING:

De Anza student resource pages:

<http://deanza.edu/online-spring/>

<http://deanza.edu/online-spring/#Learning>

Canvas Help:

<https://www.deanza.edu/online-ed/help.html>

C. COURSE OVERVIEW AND LEARNING OBJECTIVES**Overview:**

- **Description:** Chem 1A is the first quarter of a three quarter General Chemistry series, and hence an introduction to the structure and reactivity of matter at the molecular level. The course will cover applications of modern chemical theories along with structured numerical problem solving to develop

critical reasoning skills. We will learn about different chemical reactions, and study molecular structures with introductions to ionic and covalent bonding. We will solve chemistry problems involving both formula and reaction stoichiometry employing the unit analysis method. There will also be an introduction to thermochemistry and a discussion of the first law of thermodynamics.

- **Prerequisites:** CHEM 25 or CHEM 30A or satisfactory score on Chemistry Placement Test; MATH 114 or equivalent.
- **Advisory:** EWRT 1A or EWRT 1AH or ESL 5.
- **Units:** 5 Units
- **Hours:** Three hours lecture, six hours laboratory per week

Course Format:

The course is divided into two separate instructional periods. A lecture period, and a lab period. These sections will both be conducted online and synchronously -which means that I will set up a zoom meeting for the scheduled class times and you are expected to be present for these class meetings. Studies have shown that students who are present and pay attention in classes are more successful in the class. So I strongly encourage each of you to attend the lectures. Attendance to each is actually mandatory. At De Anza College, **the lab and lecture may not be taken as separate courses under any circumstances.**

Course objectives and student learning outcomes

Student Learning Outcomes

- **Identify and explain trends in the periodic table.**
- **Construct balanced reaction equations and illustrate principles of stoichiometry.**
- **Apply the first law of thermodynamics to chemical reactions.**

Course Objectives

- Examine contributions by investigators of diverse cultures and times to the body of chemical knowledge, with an emphasis on physical and chemical conceptual frameworks. Investigate the critical aspects of measurement.
- Explore the historical development of understanding the structure of the atom.
- Assess the development of the Periodic Table of Elements in light of modern atomic theory.
- Differentiate the causes and types of molecular bonding.

- Appraise the effect of quantum mechanics on formulation of molecular structure.
- Employ systematic nomenclature to the identification of molecules.
- Utilize the principles of stoichiometry to analyze compounds, chemical mixtures, and reactions.
- Examine the prominent characteristics of solutions.
- Classify the major types of chemical reactions.
- Apply the essential principles of thermodynamics to chemical systems.

Lab Objectives

- Always do the reading assignment (lab manual) before coming to lab lecture.
- Learn to work safely in the lab.
 - *Learn proper separation of chemical waste and safe waste disposal*
 - *Be familiar with MSDS*
 - *Be vigilant about personal safety and the safety of others around you*
 - *Use of Personal Protective Equipment (i.e safety goggles)*
 - *Maintain a clean and safe lab environment*
 - *Learn proper Chemical Labeling*
 - *Be familiar with Emergency Procedures*
- Be able to follow protocols accurately.
- Maintain an accurate, complete, and up-to-date Lab Notebook.
 - *Keep a written and current record of all procedures and results.*
 - *Perform data analysis, such as graphs, tables as appropriate.*
 - *Write logical and well-founded conclusions and discussions.*
- Be able to communicate science.
 - *Prepare meaningful graphs and tables that present your results.*
 - *Be able to demonstrate your comprehension of the data by sound data interpretation.*
 - *Prepare written lab reports that are clear, complete, with use of college level grammar, demonstrating critical thinking skills as they pertain to the practice of scientific method.*

D. REQUIRED MATERIALS

You will need to have a stable internet connection to be able to follow Lectures and Lab simulations. Please let me know as soon as possible if you think you might need assistance.

- **Textbook: *The Molecular Nature of Matter and Change***, 8th Edition by Silberberg and Amateis (*McGraw-Hill*) ISBN: 9781309097182. You will have free access to the online version of this textbook. You can purchase it if you'd like to own a hard copy. This textbook will be used for the Chem 1 A-B-C.
- **Lab Manual:** Lab procedures and assignments are **posted on Canvas**. We will be using online simulations for some of the labs. All the labs for Chem1A can be found online, however, we will not be doing all of them as presented, instead, there will be simulations and assignments.

<http://www.deanza.edu/chemistry/Chem1A.html>

- **Calculator:** A simple scientific calculator with natural log functionality is necessary and sufficient for this class. You can use previously purchased ones, but graphing functionality will not be necessary to use.
- **Supplemental Texts:**
 - OpenStax Chemistry, 2nd edition. Available **free** online at <https://cnx.org/contents/f8zJz5tx@9.18:DY-noYmh@9/Introduction>

E. COURSE WORK AND GRADING

Grading Scheme

Lecture	70% of Total Grade
<i>Homework Assignments (ALEKS)</i>	<i>25 % of Lecture</i>
<i>Quizzes and Chapter Assessments (2)</i>	<i>10% + 30% of Lecture</i>
<i>Final Exam</i>	<i>30% of Lecture</i>
<i>Participation</i>	<i>5% of Lecture</i>
Lab	30% of Total Grade
<i>Lab Exercises</i>	<i>50 % of Lab</i>
<i>PreLabs + Lab Quizzes</i>	<i>15 % of Lab</i>
<i>Lab Final Exam</i>	<i>30 % of Lab</i>
<i>Participation</i>	<i>5 % of Lab</i>

Grade Scale:

A+	97.0 – 100.0 %	C+	73.0 – 76.9 %
A	90.0 – 96.9 %	C	70.0 – 72.9 %
A–	87.0 – 89.9 %	D+	66.0 – 69.9 %
B+	84.0 – 86.9 %	D	63.0 – 65.9 %
B	80.0 – 83.9 %	D–	60.0 – 62.9 %
B–	77.0 – 79.9 %	F	0 – 60%

NOTES ON GRADING:

- There will not be a **curve** in general.
- Final Exam is **cumulative**
- A grade of “**C**” (**% 70**) or **better** is required to pass the course
- You will need to **pass both lab and lecture** to be able to pass the course

Work Expectation:

Each week there are 2x 75 min lectures, and 2x 3 hour lab sections. Expect to spend an additional 8-12 hours a week on the course.

You will spend additional time preparing for the labs (PreLab), practicing/carrying out the Lab simulations, Studying on ALEKS (see below for explanation), answering quiz questions, and writing up the results from the labs (Lab WriteUp or Post Lab Activity), as well as preparing for Quizzes and Midterms. You are expected to join class having done some related reading and chapter assignments.

LECTURE**1. Quizzes and Chapter Assessments - 10% + 30% of Lecture Grade**

There will be two “Chapter Assessments” . The schedule can be found in the course calendar. The assessments will consist of the material covered in lecture, and will also assess your problem solving skills.

- ***I will be testing for concepts.***
- ***I will provide Study Guides***

2. FINAL EXAM - 30% of Lecture Grade

The final exam is a cumulative exam, covering all of the lecture material, and is worth 30% of your lecture grade. No make-up exam will be given if you miss the final.

- The final exam will take place in the last week of class. Time and Format TBD

3. ASSIGNMENTS -25 % of Lecture Grade

In Chem 1A, the following Chapters will be covered in order from *Silberberg: Chapters 1-4, 6-11*

- **We will be supplementing our online learning with ALEKS:**
- **ALEKS: Assessment and LEarning in Knowledge Spaces** is a Web-based, artificially intelligent assessment and learning system. As you work through a course, ALEKS periodically will reassess you to ensure that topics learned are also retained. It's been shown that a high level of mastery of the ALEKS course correlates closely to success in the actual course.
- Assignment grade will be based on your progress on ALEKS as well as assigned end-of-chapter problems..
- **Reading:** Please read the assigned textbook chapters carefully **before** coming to lecture.
- **Problem solving:** Additionally, you might be assigned problems from the textbook to follow up and to reinforce your knowledge of the topics. These problems will help increase your grasp of the material. Please make sure to work on and understand the sample problems available to you in your textbook before you attempt the assignment problems. Chapter assessments may include similar problems.

4. PARTICIPATION -5 % of Lecture Grade

- As long as you show up and show effort, you will get full credit

Do not hesitate to drop in to the office hours if for any reason you think you are falling behind, need reinforcement of material or simply to say hi. Office hours are a crucial part of the support system the students have.

Remember “practice makes perfect” and “mistakes are the stepping stones to learning”. It is essential that you attempt as many problems as possible

LAB

1. PRELABS and QUIZZES - 15% of Lab Grade

PreLab

- Before you start your simulation, you will create a “Prelab” if required, and submit electronically for some of the labs. The prelab format will be discussed, and the list of labs are scheduled in the Lab Schedule.

Include the following in your PreLab

- Name and date on each page.
- Title write the title of the exercise at the top.
- Page number as in A1-1, A1-2 (for exercise A1 page 1, etc)
- Purpose/Abstract in your own words, state the goals for doing this experiment in abstract form.
- Information about the simulation/activit. This can be a summary of what is expected.

Lab Quizzes

- You can also expect two or so lab quizzes, based on the discussions in class, testing concepts behind the lab procedures and ability to perform calculations such as those done in the lab.

2. LAB NOTEBOOK and LAB WriteUps - 50% of Lab Grade

Please read very carefully. We will go over the lab expectations within the first lecture.

Lab Write-Ups, if required, are generally due on a date following the end of that particular exercise and must be submitted online. **Note that exact due dates are listed on your schedule. There might be exceptions.**

You are required to keep a Lab Notebook that you designate for lab. It could be an old lab notebook you have at home, or any bound notebook. I will ask you to send me pictures of your notebook periodically.

What Goes in a Lab Notebook/Lab WriteUp

- First couple of Pages should be left blank for a **Table of Contents** - which basically lists the experiments we are doing with the corresponding page numbers for the start of the Experiment.
- **PreLab for each experiment** should also be written here. You need to submit your prelab online BEFORE you start doing the lab simulation or exercise.
- ***ALL DATA RECORDINGS GO IN YOUR BOUND LAB NOTEBOOK***
Use ink to record your Data. Mistakes can be crossed out with a simple line through. Use of white-out during Data Collection is prohibited
- **Some exercises will end with a “Lab WriteUp” which is to be submitted to me online after the experiment is concluded on the due date indicated on your schedule.** The WriteUp should be done as a report on a separate word (or similar) document and will state the purpose of doing the experiment/simulation in your own words, abstract for the experiment (brief description), data/results, discussion, and a conclusion.
- **This is the type-written description of your observations, the data you collected, your conclusion, discussion and/or any assignment.**
- A list of Exercises, Prelabs and Assignments are detailed in the course schedule.
- ***Assignments*** For some lab experiments, you might be asked include an assignment with your lab writeup. Assignments will also be posted on Canvas

3. LAB FINAL - 30% of Lab Grade

There will be one lab final covering the concepts/calculations and core techniques. It will be administered at the end of the course. Exam Date is set as Thu 6/18, it will be a take home exam.

4. PARTICIPATION - 5% of Lab Grade

You will receive points based on your performance in the lab class that will take into account the following:

- whether you are prepared for the lab;
- whether you demonstrate that you have a strong understanding of the lab exercises;

F. POLICIES

PLEASE READ THE FOLLOWING POLICIES VERY CAREFULLY

- **Registration:** *Enrollment is strictly limited to 30 students per section.* Spaces are filled in accordance with the official class roster from Admissions and Records, followed by the official wait list. Any errors must be addressed directly with Admission and Records. Waitlisted students **sign in to the zoom meeting** for the first day of class, but may not be assigned a code until someone drops the course within the first two weeks
- **Policy on attendance:** Attendance of **both** the Lecture and Labs are required for the successful completion of this course. Unexcused absences will affect your grade. **Attendance is expected for all lectures, all lab lectures and all labs. The De Anza College Chemistry Department does not offer make-up labs.**
- **Policy on missing class:** **Since we are doing lecture and lab synchronously,** If you need to miss class you must notify the instructor **at least 24 hours in advance** for approval. Missing a lab period may affect your grade negatively. If you have an excused absence, we can talk about ways to compensate for the missed lab. **You will be dropped from the course for any unexcused absences during the first two weeks of class.**
- **Absences from lecture or lab will be evaluated on a case by case basis. It is your responsibility to contact the Instructor for any absences. Clear Communication is the best whatever the reason is. If I don't know your reasons, I can't be reasonable...**
- **Policy on late assignments/lab notebooks/lab report:** Items turned in late will receive an automatic 20% deduction in points.

ALL assignments, lab write-ups, reports, and exams must be completed and turned in to receive credit for this course. No

exceptions. It is the responsibility of the student to arrange for make-ups for missed work.

- **Policy on Final exams:** Final exam dates are determined by the De Anza College and cannot be changed. Please find the exam dates from your course calendar, and put all of the dates into your calendar.
- **Dropping the course:** Dropping the course must be done through the Admissions and Records office. **It's the student's responsibility to withdraw from the course by the deadline set by the Admissions and Records Office.** Dropping the course after the deadline will result in a (W-withdrawal) on your transcript.
- **Policy on Grading:** The course can also be taken as Pass/no Pa

Policy on plagiarism There's a zero tolerance policy for academic misconduct. You should remember as a De Anza College student, you agreed to abide by the policies of the De Anza College Rules of Conduct. It is expected that you are familiar with the code of conduct and disciplinary actions that may result from academic misconduct. **All submitted work should be your own, and should represent your own grasp of the material. Cheating will not be tolerated.**

If you have any questions about what constitutes unfair collaboration or plagiarism, please contact the instructor.

These policies are found in the De Anza College manual:
<https://www.deanza.edu/studenthandbook/academic-integrity.html>

Students who violate academic integrity policy (e.g. are caught cheating or plagiarizing) will be reported to the Dean of Student Services. Any plagiarized material will receive a 0.

G. CHEM 1A - LECTURE SCHEDULE (subject to change)

	Date	Lecture	Assignments
1	Tue 4/14	Course Introduction-Chem 1A Essentials Getting to know you and me Chapter 1.1 - 1.5 Definitions and units	Read Chapter 1
	Thu 4/16	Chapter 2 2.1-2.5 Atomic view of matter, Dalton's Atomic Theory	Read 2.1-2.5 Assignment 1

	Date	Lecture	Assignments
2	Tue 4/21	Chapter 2 2.6-2.9 Elements and the Periodic Table, Introduction to Bonding, Nomenclature Chapter 3 3.1 The Mole	Read 2.6-2.9, 3.1
	Thu 4/23	Chapter 3 3.2-3.4 Stoichiometry	Assignment 2

	Date	Lecture	Assignments
3	Tue 4/28	Exam 1 Chapters 1-3	Assignment 3
	Thu 4/30	Chapter 4 4.1-4.3 Water as solvent, Precipitation Rxns	Read 4.1-4.3

	Date	Lecture	Assignments
4	Tue 5/05	Chapter 4 4.4 Acid-Base Reactions	Read 4.4
	Thu 5/07	Chapter 4 4.5-4.6 Oxidation-Reduction (Redox) Rxns	Read 4.5-4.6

	Date	Lecture	Assignments
5	Tue 5/12	Chapter 4 4.7 Equilibrium State Chapter 6 6.1-6.3 Enthalpy and Calorimetry	Read 4.7, 6.1 - 6.3
	Thu 5/14	Chapter 6 6.4-6.6 Hess's Law	Read 6.4 - 6.6

	Date	Lecture	Assignments
6	Tue 5/19	Chapter 7 7.1-7.3 Light and the Atomic Spectra Heisenberg's Uncertainty Principle	Read 7.1-7.3 Assignment 4 (Chapter 4)
	Thu 5/21	Chapter 7 7.4 Quantum mechanical Model of the Atom	Read 7.4 Assignment 5 (Chapter 6)

	Date	Lecture	Assignments
7	Tue 5/26	Exam 2 Chapters 4, 6, 7	Assignment 6 (Chapter 7)
	Thu 5/28	Chapter 8 8.1-8.2 Electron Configurations and the Periodic Table	Read 8.1-8.2

	Date	Lecture	Assignments
8	Tue 6/02	Chapter 8 8.3-8.4 Atomic Properties and Chemical Reactivity	Read 8.3-8.4
	Thu 6/04	Chapter 9 9.1-9.4 Covalent/Ionic Bonding	Read 9.1-9.4

	Date	Lecture	Assignments
9	Tue 6/09	Chapter 9 9.5-9.6 Bond Polarity	Read 9.5-9.6 Assignment 7 (Chapter 8)
	Thu 6/11	Chapter 10 10.1-10.3 Lewis Structures and VSEPR Theory, Molecular Shapes	Read 10.1-10.3

	Date	Lecture	Assignments
10	Tue 6/16	Chapter 11 11.1-11.2 Lewis Structures and VSEPR Theory	Read 11.1-11.2 Assignment 8 (Chapter 9)
	Thu 6/18	Chapter 11 11.3 Molecular Orbital Theory	Read 11.3 Assignment 9 (Chapter 10)

	Date	Lecture	Assignments
11	Tue 6/23	Finals week Chem Final TBD	Assignment 10 (Chapter 11)
	Thu 6/25		

H. CHEM 1A - LAB SCHEDULE (subject to change)

	Date	Lab	Due
Wk 1	Tue 4/14	Introduction to Lab Lab Expectations How are we going to do lab online 🙄 PreLab, Reports, Maintaining a Notebook Labster Overview Lab Safety Exercise	
	Thu 4/16	Lab A1 Measurements Lab Activities: Lab Manual A1 dry lab Labster Solution Preparation ChemCollective Overview Making Stock Solutions and/or Alcohol Density Problem	-Read A1 Pages -PreLab A1

	Date	Lab	Due
Wk 2	Tue 4/21	Lab A2 Nomenclature Activities Lab Manual A2 dry lab submit worksheet online	-Read A2 Pages 1-6
	Thu 4/23	Lab A3 Hydrate Lab/Gravimetric Analysis I Activities: Labster Gravimetric Analysis /Stoichiometry	-Read A3 Pages 1-2 -PreLab A3

	Date	Lab	Due
Wk 3	Tue 4/28	Lab A3 Hydrate Lab/Gravimetric Analysis II Activities ChemCollective AgCl Unknown Lab	
	Thu 4/30	Lab Quiz (A1-A3) Lab A4 Precipitation Reaction and Limiting Reagents Activities: ChemCollective Stoichiometry and Solution Preparation, limiting reagent	-Read A4 Pages 1-4 -PreLab A4

	Date	Lab	Due
Wk 4	Tue 5/5	Lab A4 Precipitation Reaction and Limiting Reagents Activities: ChemCollective Stoichiometry and Solution Preparation, limiting reagent	-A3 Lab WriteUp for AgCl lab
	Thu 5/7	Lab A5 Types of Reactions I Activities: Watch videos and go over different types of chemical reactions	-Read A5 Pages 1-4

	Date	Lab	Due
Wk 5	Tue 5/12	Lab A5 Types of Reactions II Activities: ChemCollective Exploring Oxidation-Reduction Rxns	
	Thu 5/14	Lab A6 Conductivity I Activities: PhET Simulation Sugar and Salt Solutions	-PostLab A5 -Read A6 Pages 1-2

	Date	Lab	Due
Wk 6	Tue 5/19	Lab Quiz (A4-A6) Lab A6 Conductivity II Activities: TBD	-PreLab A6 vernier kit
	Thu 5/21	Lab A8 Calorimetry I Activities: ChemCollective Heat of Reaction	-Read A8 Page 1 -PreLab A8-I

	Date	Lab	Due
Wk 7	Tue 5/26	Lab A8 Calorimetry II Activities: ChemCollective Hess's Law	-PreLab A8-II
	Thu 5/28	Lab A7 Acid-Base Titration I Activities: Labster: Acid-Base Titration	-Read A7 Pages 1-4

	Date	Lab	Due
Wk 8	Tue 6/2	Lab A7 Acid-Base Titration II Activities: ChemCollective Standardization of NaOH with KHP	-PreLab A7-II
	Thu 6/4	Lab A7 Acid-Base Titration II Activities: ChemCollective Standardization of NaOH with KHP	

	Date	Lab	Due
Wk 9	Tue 6/9	Lab A9 RedOx Titration Activities: TBD Acid-Base/RedOx Titration Calculations	-PostLab A7 -Read A9 Pages 1-3
	Thu 6/11	Lab A10 Line Spectrum Activities: Lab Manual A9 dry lab PhET Simulations	-Read A10 Pages 1-2

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	Date	Lecture	Lab
Wk 10	Tue 6/16	Lab A11 Lewis Structures and Shapes of Molecules and Ions Activities: Lab Manual A11 dry lab Avogadro or MolView for 3D Modeling Submit	-Titration Worksheet -Read A11 Pages 1-3
	Thu 6/18	Lab Final Exam	-Lab Report A10

Student Learning Outcome(s):

- *Identify and explain trends in the periodic table.
- *Construct balanced reaction equations and illustrate principles of stoichiometry.
- *Apply the first law of thermodynamics to chemical reactions.