

# Introduction to General, Organic and Biochemistry I

## Chem 30A/section 01

### Course CRN 00213

Instructor: Dr. Yue Liu ([liyue@fhda.edu](mailto:liyue@fhda.edu))

Office hours: Wed. 12 - 2 PM in SC1224

Session	Room	Days	Start Time	End Time
Lecture	SC34	M/W	2:30 PM	4:20 PM
Lab	SC2204	M	11:30 AM	2:20 PM

#### Course Description:

This course is the first part of a two-part class to be taken in sequence by students entering allied health fields. The focus of this first part is an introduction to general chemistry, beginning with a discussion of various measurement tools, followed by atomic theory, bonding theory, chemical equations, stoichiometric calculations based on chemical equations, gases, solutions, acid-base chemistry, and nuclear chemistry.

Prerequisites: MATH 114 or equivalent. Advisory: EWRT 211 and READ 211 (or LART 211), or ESL 272 and 273.

#### Necessary Materials

1. Text book: General, Organic, and Biological Chemistry, Janice G Smith, McGraw-Hill 3rd ed 2016
2. 30A experiment handouts. Downloaded from <http://www.deanza.edu/chemistry/pdf/30A/>
3. A laboratory notebook
4. A scientific calculator that has at least log and exponential functions is required.
5. Safety goggles, Visorgogs® or Z87.1-2010 Rates Safety Glasses
6. 16 scantron sheets (Form No. 882-E)

#### Resources

- **Disability Support Program and Services** is located in S41 (408-864-8753 or 408-864-8748 TTY or [dss@deanza.edu](mailto:dss@deanza.edu)) to coordinate reasonable accommodations for students with verifiable documentation. <http://www.deanza.edu/dsps/>
- **Tutoring service** is located in S43 among many other campus services offered by the student success center: <http://www.deanza.edu/studentssuccess>

#### Adds and Drops

**If you do not show up on the first day of class, you will be dropped.** If you choose to drop the course at any point during the quarter, it is your responsibility to withdraw from the course through Admissions and Records by the appropriate deadline.

Last Day for Adds	Apr. 21, 2018
Last Day for Refund	Apr. 22, 2018
Last Day for Drops w/o W	Apr. 22, 2018

Last day for P/NP	May 04, 2018
Last Day for Drops with W	Jun. 01, 2018

## COURSE GRADING POLICIES:

Types of Assignments	Points per Item	Number of Assignments	Total points	Percentage
Lecture Exams	100	3	300	36%
Quizzes	10	10	100 (drop the lowest two)	12%
Lab Final	100	1	100	12%
Pre-lab	10	7	70	8%
Lab Report	10	7	70	8%
Final Exam	200	1	200	24%
Total			840	

97-100 %	A+	93-97 %	A	90-93 %	A-
85-90 %	B+	82-85 %	B	77-82 %	B-
74-77 %	C+	70-74 %	C		
60-70%	D	0-60 %	F		

## ATTENDANCE

It is expected that you attend and participate in all of the lecture and laboratory sessions. If you must be absent, **you are responsible to contact the instructor via emails**. You should also exchange phone numbers with a few classmates whom you can contact regarding material missed if you must be absent.

## HOMEWORK

You need to pick questions from every section at the end of each chapter. Do a total of 30 questions for every chapter, and check with the answers published in the appendix.

## EXAMS

**Make-up exams will NOT be given.** Accommodations will be made ONLY for VERIFIED illness or legitimate emergencies. Documentation is required.

## CLASS RULES AND REGULATIONS-Professional behavior is expected

- **Arrive on time.** The classroom is an academic environment where students come to focus and learn. Those students who arrive on time, ready to learn, should not be disturbed by students coming in late. If you arrive late to lecture, please enter quietly from the back of the classroom.
- **Be polite** to your instructor and fellow students. Any type of vulgar or rude language toward the instructor or another student may result in dismissal from the course. This rule applies to emails and phone messages as well as face-to-face exchanges!

***Any student who, in my judgment, is habitually disruptive or rude may be dismissed from the class.***

Please be polite to mute your cell phones or pagers during lecture and lab.

### **ACADEMIC DISHONESTY:**

It is your responsibility to understand what constitutes academic dishonesty in accordance with the De Anza College Academic Honor Code.

Academic dishonesty includes:

- Plagiarism
- During an exam, communicating or transferring information to another student, receiving information from someone else, looking at another person's exam, and/or using unauthorized materials such as text books, notes, etc.
- Having another person complete and submit work in your name.
- Lying to an instructor to improve your grade.
- Altering a graded work after it has been returned and then submitting the work for regrading.

**The first offense results in a zero of that assignment for all students involved. The second offense results in an "F" grade.**

### Laboratory syllabus

#### Daily Check-in and Check-out Policies

- All students are expected to arrive to lab on time. If you are **more than 20 minutes late**, you get one point deduction for every 10 minutes that you are late for.
- All students are expected to do a conscientious and thorough job of cleaning up after themselves, whether it be in their own work area in the lab, or shared areas such as the chemical supply fume hood, the balance area, and the waste fume hood. You need to **obtain my signature after you finish** cleaning up before you leave.

#### Lab Safety

- Being safe in the lab is a top priority. Any unsafe behavior, intentional or not, will be noted and may be cause for dismissal from the class.
- For your protection, safety goggles or visorgogs with indirect ventilation and an ANSI minimum rating of Z87.1-2010 must be worn AT ALL TIMES in the laboratory. TWO warnings will be issued to any student that is observed wearing their goggles/visorgogs on their forehead, hanging them around their neck, etc. instead of wearing over their eyes. If the warning is disregarded, expulsion from the lab may result.

#### Absences

- Any unexcused absence results in a zero grade for the missed lab.

- An excused absence, upon verification with written proof, receives partial credit: up to 3 points for the pre-lab and up to 7 points for the lab report (completed using other students' data).

#### Late submission

- All pre-labs should be prepared before you come to the lab. I will check the pre-lab after I finish the lab lecture. If you have not started or finished the pre-lab by then, your pre-lab assignment will receive 1-4 points deduction.
- Late lab reports receive 1 point deduction per lab meeting.

### **Lab Final is Open Lab Notebook!**

#### **How to Prepare The Pre-Lab Write-up**

Medicine, dentistry, pharmacy, engineering, biology, physics, chemistry and a large number of other fields require perceptive observations and accurate data recording. The chemistry laboratory provides a good opportunity for this training and practice. A laboratory notebook is required, and it will be brought to every laboratory session. **PEN ONLY!**

Prepare your notebook for each experiment **prior to the start of lab lecture**. **NOTE:** All information must be entered into your notebook by you in PEN! You are not allowed to “cut and paste” this information from the lab packet.

#### 1. INTRODUCTION

- A specific title.
- Name
- Date
- Page number
- A briefly but clearly stated objective(s).
- Applicable background summary including, important chemical reactions, mathematical formulas, etc.

#### 2. LIST OF REAGENTS

- Include a list of necessary STOCK reagents. Make sure all concentrations are noted.

#### 3. A BRIEF OUTLINE OF THE EXPERIMENTAL PROCEDURE

The procedure should be a brief but complete outline of what will be done in the lab.

**Include what to do information.** Details on **how to do** the lab are **not** needed.

The written procedure should contain enough information for the lab instructor to do the experiment and collect the proper data. Do not include specific instructions on how to run lab instruments.

#### 4. DATA

Data section contain a clear and complete record of all observations and measurements. There are two types of data:

- (a) Quantitative measurements, e.g. The dog weighs 100 pounds. (includes units)
- (b) Qualitative observations, e.g. The dog is large and is colored tan with blue spots.
- **Data tables should have appropriate headings. Remember to include units and to record data to the proper number of significant figures.**
- The original data are to be recorded **directly and legibly in permanent ink in your notebook, NO PENCIL! POINTS WILL BE DEDUCTED FOR THE USE OF PENCIL IN LAB! DO NOT RECORD DATA ANYWHERE BUT IN YOUR NOTEBOOK!** If an error is made, a **single** line is drawn through the error (~~like this~~) and the new value is written above, below or next to the original entry. **Do NOT use correction fluid or erasers. POINTS WILL BE DEDUCTED!**
- Finally, sign and date each **data** page.

#### Some tips on preparing your notebook:

- Make sure you start each experiment on a new page.
- Make sure all chemicals needed are listed with the necessary concentrations.
- What glassware to be used can usually be omitted in the procedure unless it is very specific. Specifying the size of a test tube or beaker is often not necessary.
- **For the procedure DO NOT INCLUDE ANY OBVIOUS “HOW TO” STEPS. ONLY INCLUDE “WHAT TO DO” STEPS.** For example, if the procedure calls for preparation of a 0.050 M NaOH solution from dilution do not include what pipet to use, how much volume to pipet etc. Your notebook simple needs to read: “Prepare 25 mL of a 0.050 M NaOH solution from a 0.10 M stock solution.”
- Omit all instructions on how to operate lab instruments, such as a pH meter. Simply state what to do. For example, “Calibrate the pH sensor using pH 4 and 10 buffers” would be an adequate step for using pH sensors.

#### Lab Notebook Grading Rubrics

Aspects Evaluated	Point Value (pt)
Completeness	2
Accuracy of Information	2
Significant Figure and Units in Data Recording	2
Legibility and Formatting	2
Pen only! <del>Correct way of correcting a wrong entry.</del> Date and sign each DATA page.	2

A sample pre-lab is given as follows:

Title: Gas Behavior

Name: Dr. Liu

Date: 3/31/2016

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### Objectives

1. To derive a mathematical relationship between  $V$  and  $T$  for a gas.
2. To develop graphing skills for data analysis.
3. To learn the LabQuest and LoggerPro software.

### Background

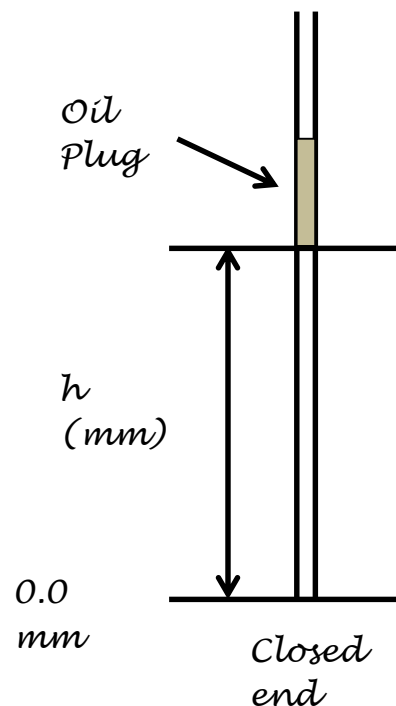
1. a gas consist of particles in constant, rapid motion that act independently of one another.
2. the volume ( $V$ ) of a gas is mostly empty space.
3. the average kinetic energy ( $KE$ ) of the gas particles is proportional to the gas temperature,  $T$  in Kelvin.
4. the elastic collisions of the gas particles with the walls of the container create the Pressure ( $P$ ) of the gas.

### List of Reagents

Mineral oil

### Experimental Procedure:

1. Record the inner diameter of the capillary tube.
2. Prepare a column of trapped air in a capillary tube by heating the tube and then immersing the open end of the tube in mineral oil. See figure.
3. With a rubber band, attached the tube to a metal ruler so the closed end is aligned with the zero mm mark of the ruler.
4. Place the tube and ruler in a water bath. Heat the water bath to boiling.
5. As the water cools, record the temperature to 0.1 C as the top of the air column ( $h$ ) passes through each mm scale division.



Week	Monday		Wednesday
	Lab	Lecture	Lecture
1	Apr. 09	Apr. 09	Apr. 11
	Course syllabus Lab check-in	Ch. 1: Matter and Measurement	Ch 2: Atoms and the Periodic Table
		<b>Quiz 1: Math skills (take home)</b>	
2	Apr. 16	Apr. 16	Jul. 18
	Lab 1: Measurements	Finish Ch 2	Ch 3: Ionic Compounds
		<b>Quiz 2: Ch 1 Quiz 1 due</b>	<b>Quiz 3: Ch 2</b>
3	Apr. 23	Apr. 23	Apr. 25
	Lab 2: Nomenclature (page 7 & 8)	Ch. 4: Covalent compound	Finish Nomenclature worksheet
	Lab report 1 (Measurements) due	<b>Quiz 4: Ch. 3</b>	
4	Apr. 30	Apr. 30	May 01
	Lab 3: Models	Review Ch. 1-4	<b>Exam 1: Ch 1-4</b>
	Lab Report 2 (Nomenclature) Due	<b>Quiz 5: Ch. 4</b>	
5	May 07	May 07	May 09
	Lab 4: Hydrate	Ch. 5: Chemical Reactions	Finish Ch. 5 Ch. 6: Energy Changes, Reaction Rates and Equilibrium
	Lab Report 3 (Models) due		
6	May 14	May 14	May 16
	Lab 5: Hydrate (2)	Finish Ch. 6	Ch. 10 Nuclear Chemistry
		<b>Quiz 6: Ch. 5</b>	<b>Quiz 7: Ch. 6</b>
7	May 21	May 21	May 23
	Lab 6: Molar Volume of a Gas	Review Ch. 5, 6, 10	<b>Exam 2: Ch. 5, 6, 10</b>
	Lab report 4 (Hydrate) due	<b>Quiz 8: Ch. 10</b>	
8	May 28	May 28	May 30

	<b>Holiday</b>	<b>Holiday</b>	Ch. 7: Gases, Liquids, and Solids
9	Jun. 04	Jun. 04	Jun. 06
	Lab 7: Conductivity	Finish Ch. 7	Ch. 8: Solutions
	Lab report 5 (Molar Volume) due	<b>Quiz 9: Ch. 7</b>	
10	Jun. 11	Jun. 11	Jun. 13
	Lab 8: Acid-Base Titration	Ch. 9: Acids and Bases	Finish Ch. 9
	Lab report 6 (Conductivity) due	<b>Quiz 10: Ch. 8</b>	
11	Jun. 18	Jun. 18	Jun. 20
	Lab check-out	Review Ch. 7-9	<b>Exam 3: Ch. 7-9</b>
	<b>Lab Final</b> Lab report 7 (Titration) due	<b>Quiz 11: Ch. 9</b> <b>Quiz 12: Ch. 1-10 (take home)</b>	<b>Quiz 12 due</b>
12	Jun. 25	Jun. 25	Jun. 27
	No Lab	No class	<b>Final Exam: Ch. 1-10 1:45 – 3:45 pm @ S35</b>

Title: Gas Behavior

Name: Dr. Liu

Date: 3/31/2016

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### Data and Observations

Inner diameter of capillary tube: 1.0 mm

### Height of air column as air is cooled.

h (mm)	T (C)
53.0	75.6
52.0	<del>64.6</del> 64.5
51.0	62.5
50.0	57.8
49.0	52.0
48.0	45.1
47.0	40.3





**Student Learning Outcome(s):**

\*Solve stoichiometric problems by applying appropriate molar relationships.

\*Identify the differences between elements and compounds and describe the chemical bonding in compounds- ionics vs. covalent.