

# Chemistry 10: Introduction to Chemistry

De Anza College Spring 2016                      Lecture: 42703                      T, Th                      5:30– 7:20 PM                      SC2202

Instructor: Dr. Paria Bakhtar                      Lab: 42703                      Th                      7:30 – 10:20 PM                      SC2202

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***This course syllabus is a contract:*** One purpose of this syllabus is to provide you with the guiding principles upon which the class runs. Another purpose is to make sure that you have, at your fingertips, answers to common questions that might arise. This document is available at all times on the class website. Make sure you read it in its entirety before you ask me any questions about the course schedule, requirements, grading, etc... It is also a contract between you the student, and I, the instructor of record. Make sure that you understand its contents fully, especially the parts that pertain to testing and the computation of your grade, because so long as you remain enrolled in the course, you are implicitly agreeing to abide by these terms.

***Course Description:*** An introduction to the discipline of chemistry, including chemical laboratory techniques and methods and a survey of important chemical principles. The course emphasizes chemistry as a subject of scientific inquiry and is designed to give the student a general appreciation for chemistry as a science. We will be examining some of the central themes of chemistry as well as how an understanding of chemistry can impact our view of historical and current events.

Prerequisites: **Advisory:** English Writing 211 and Reading 211 (**or Language Arts 211**), or English as a Second Language 272 and 273; **Mathematics 212 or equivalent.**

## Course Materials( Required):

1. ***Textbook:*** John W. Hill, Terry W. McCreary; ***Chemistry for Changing times, 14<sup>th</sup> edition***
2. **A scientific or graphing calculator** (Must have log and exponential functions. *Graphing is not necessary.* You **may not** use your phone as a calculator for any quizzes, exercises, or exams.)
3. **Lab Manual:** Gibson & Suchocki; **Conceptual Chemistry. Fifth edition**
4. **Safety Goggles**

## Course Materials (Optional):

1. Student Study Guide for textbook.
2. Lab Coat and gloves

## Resources

***Tutoring:*** De Anza's tutorial center is in L47. This and many other campus services can be found as part of the student success center: <http://www.deanza.edu/studentuccess>

***Disability Support Program and Services:*** DSPS can help you get the right tools to succeed. Please contact DSP&S for a TAV form if you require academic accommodation on assessments (ie. additional time, a reduced-distraction environment, the use of alternative media/assistive technology, etc.). No accommodation will be given otherwise. <http://www.deanza.edu/dsps/>

## Grades

	%
Homework	20
Exams (2)	30
Lecture final	25
Lab	25
Total	100

Grading scale			
Grade	Percentage	Grade	Percentage
A+	98-100	C+	75-78
A	92-97	C	69-74
A-	89-91	D+	65-68
B+	85-88	D	62-64
B	82-84	D-	59-61
B-	79-81	F	0-58

**Homework:** Chemistry is not a spectator sport! The only way to learn chemistry is by working the problems. To acquire particular skill, you must practice it! If you do not understand how to do a particular problem, go back to your notes from lecture, the chances are good that I did a similar problem in class. Also there is at least one similar example in the textbook. If still have question, I strongly encourage you to come and see me during the office hour. Four set of homeworks (each 5% of your grade) will be posted on the course website with their due date, Consisting of a selection of problems in homework sets, covering several chapters. **I strongly suggest that you work out several of the problems from each section at the end of each chapter**, because approximately 50% of each exam will contain homework or similar problems. Copying another student's homework problems is counterproductive. If you're not working it out, you won't get the benefit.

**Exams:** There will be 2 chapter exams worth 10% of your grade each. Exams will be a combination of any of the following: multiple choice, short answer/calculation problems, and vocabulary questions. Early and late exams are not administered. Missing an exam will result in a zero for that exam without proof of an excused absence (doctor's note, police report, etc...)

**Final Exam:** The Final Exam is cumulative and will have the same format as the chapter exams. The exam will be given **Tuesday, June 21st, 6:15-8:15 p.m**

\*\*If you cannot make your assigned time, you should not enroll in this class.\*\*

Lab: The lab portion of this course will be 25% of your total grade. This grade is based on the lab reports, performance and the lab final exam, more to follow in the lab section.

## Class policies:

### Time Requirement:

This class includes appx. 4 hours of lecture and appx. 3 hours of lab per week. In order to receive a "C" or better grade, you should allow 10-16 hours of studying, reading, and preparing outside of class PER WEEK. Help yourself to do your best by making time to keep up with the reading and homework. If this time commitment is not possible given your current situation, please consider taking this class at a later date when you do have more time available.

### Lecture Attendance:

Attendance is a critical component of the learning process, and the lecture will cover material that may not appear in your text and help clarify the material that is. Learning Chemistry effectively depends on building up from a base of knowledge. If you do not set a firm

foundation, you will not be able to build your understanding of the field effectively. In other words, miss too many classes and you'll likely fail the class.

### ***Class Behavior:***

Be ready to start class at the scheduled time. Please arrive on time and plan on staying the entire session as late arrivals and early departures distract everyone. If you are unavoidably late, please enter quietly and find your seat as quickly and quietly. Please do not disrupt class with irrelevant conversations, either in the form of inappropriate comments or private conversations. I would always prefer you show up a little late as opposed to skipping the class entirely.

***Please turn your cell phone OFF when you enter the class or lab. You may NOT take calls or texts during either, except for emergencies. Students caught abusing this rule may be docked points or expelled from class or lab.***

### ***Academic Dishonesty:***

Cheating or plagiarizing another student's work, in whole or part, will result in a zero for the assignment, a referral to the dean and my immense displeasure. Any case where you attempt to gain unfair advantage over other students or attempt to pass off another's work as your own is cheating. Please see me if you have any questions. You implicitly agree to abide by the Honor Code as a condition of enrolment in this class: <http://www.deanza.edu/studenthandbook/academic-integrity.html>

### ***Dropping the Class:***

If you wish to drop the class after the first 2 weeks, it is your responsibility to do so. If you fail to drop the class you will be assigned a grade in keeping with your submitted work.

### ***Questions/Help:***

I am available to answer questions during office hours, by email, or by appointment. Please feel free to contact me with any problems or concerns that you have. Also remember that your fellow students are great resources.

### ***Attendance Note***

You are responsible for all the material covered in this course, and it is expected that you attend and participate in all of the lecture and laboratory sessions. If you must be absent, then it is in your best interest to contact your instructor as soon as possible in order to find out what work you have missed.

***\*\*Due to the number of students wishing to enroll in this class, any unjustified absences during the \*\*first two weeks of class will result in you being dropped.*** Let me know if you plan to miss class during the first two weeks of class to avoid being dropped automatically.

## **Student Learning Outcome Statements**

- Develop problem solving techniques by applying the "Scientific Method" to chemical data.
- Analyze and solve chemical questions utilizing information presented in the periodic table of the elements.
- Evaluate current scientific theories and observations utilizing a scientific mindset and an understanding of matter and the changes it undergoes.

## ***Tentative Lecture Schedule for Chem 10: Subject to Change***

### **Spring 2016 De Anza College**

<b>Week</b>	<b>Date</b>	<b>Lecture</b>	<b>Section</b>	<b>Homework due</b>
<b>1</b>	4/5 4/7	Chapter 1 : Chemistry	1-31	
<b>2</b>	4/12 4/14	Chapter 2 : Atom	41-57	
<b>3</b>	4/19 4/23	Chapter 3 : Atomic Structure	65-87	<b>HW #1</b> <b>(Chapter 1, 2)</b>
<b>4</b>	4/28 4/30	Chapter 4 : Chemical Bonds	95-127	
<b>5</b>	5/3 5/5	Chapter 4 : Chemical Bonds Exam 1 (Chapter 1-4)	95-127	
<b>6</b>	5/10 5/12	Chapter 5 : Chemical Accounting	136-156	<b>HW #2</b> <b>(Chapter 3, 4)</b>
<b>7</b>	5/17 5/19	Chapter 7: Acid and Bases	189-208	
<b>8</b>	5/24 5/26	Chapter 8: Oxidation and Reduction	216-239	<b>HW #3</b> <b>(Chapter 5, 7)</b>
<b>9</b>	5/30 6/2	Chapter 8: Oxidation and Reduction	216-239	
<b>10</b>	6/7 6/9	Exam 2 (Chapter 5,7,8) Chapter 11: Nuclear Chemistry	316-343	
<b>11</b>	6/14-6/16	Review		<b>HW #4</b> <b>(Chapter 8, 11)</b>
<b>12</b>	6/21	<b>Final Exam</b>		

<b>Registration Deadline</b>	<b>Last day to add class</b>	<b>Drop class with</b>	<b>Pass/fail</b>	<b>Drop class with a 'w'</b>
<b>Spring 2016</b>	4/16/16 (Sat)	4/17/16 (Sun)	4/29/16 (Fri)	5/27/16 (Fri)

## Lecture content

<b>Text Coverage</b>	<b>Key Concepts</b>	<b>Recommended Text Problems</b>
Chapter 1 : Chemistry	The Scientific Method, Classifying Matter, Units and Unit Conversion	1, 13, 19, 21, 25, 29, 31, 33, 35, 39, 41, 45, 47, 53, 55, 65, 67
Chapter 2 : Atom	Atomic Theory and Origins, The Periodic Table	15, 17, 19, 21, 25, 27, 43, 45, 47
Chapter 3 : Atomic Structure	Atomic Structure, Electron Configuration, Orbitals	5, 13, 15, 17, 19, 21, 23, 25, 27, 28-32
Chapter 4 : Chemical Bonds	The octet rule, Lewis Structures, Chemical Nomenclature, Polarity	3, 5, 6, 9, 11, 13, 17, 19, 21, 23, 27, 29, 31, 33, 35, 37, 39, 41, 43, 47, 49, 51, 53, 55, 57, 59, 69
Chapter 5 : Chemical Accounting	Balancing Chemical Equations, The Mole, Molarity	2, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 33, 35, 39, 41, 43, 45
Chapter 7: Acid and Bases	Identifying Acids and Bases, Brønsted-Lowry theory, Acid-Base Reactions, pH	5, 6, 9, 13, 15, 17, 19, 21, 23, 25, 29, 31, 33, 35, 39, 41, 43, 45, 47, 49, 51, 55
Chapter 8: Oxidation and Reduction	Identifying Redox, Fuel Cells, Explaining Batteries and Corrosion	1, 13, 15, 16, 17, 23, 25, 27, 37, 39, 41
Chapter 11: Nuclear Chemistry	Nuclear Reactions, What is Radiation, Half Life, Uses for Nuclear Reactions	2,4,6,7,8,21,23,27,31,35

# Chemistry 10: Chemistry Laboratory

De Anza College Spring 2016

Instructor: Dr. Paria Bakhtar

Lab: 42703 Th 7:30 – 10:20 PM SC2202

Email: [bakhtarparia@fhda.edu](mailto:bakhtarparia@fhda.edu)

Office Hours: TTh 12:00 – 13:00 PM Library, room TBD

## Lab Materials( Required):

1. **Lab Manual:** Gibson & Suchocki; **Conceptual Chemistry. Fifth edition**
2. OSHA-approved Safety Goggles (Indirect Vent, Z87)
3. Disposable purple nitrile gloves (*optional*)
4. Knee length lab coat or lab apron (*optional*)
5. **A scientific or graphing calculator** (Must have log and exponential functions. *Graphing is not necessary.* You **may not** use your phone as a calculator for any quizzes, exercises, or exams.)

**CAREFULLY** read the attached DeAnza Chemistry Department laboratory policies and safety and housekeeping rules. Also make sure to read the first chapter of the lab manual, “ Laboratory Safety and common techniques” before coming to first session of the lab.

You must complete and turn in the Student Contract (provided by instructor) by the end of first lab meeting. You will not be allowed to attend lab until the Contract is signed and turned in.

## LAB POLICIES:

### **LABORATORY CHECK-IN**

Locker check-in will take place the first day of lab. It is your responsibility to make sure that all glassware is present and unbroken at the time you check in. If at any point after the first day of lab you need to replace an item in your locker, your student account will get charged for it. ***If you drop this course, then you must arrange to check-out your locker with your instructor during your regularly scheduled lab period.*** The stockroom technician or other instructors WILL NOT check-out lockers for any students. **Any person who has not checked out by the end of the last scheduled lab period for the quarter will have an administrative fee added to their student account and a hold put on their registration.**

### **LABORATORY PROCEDURES AND POLICIES**

All students are expected to arrive to lab on time and to come to lab prepared to carry out the experiment scheduled for that session. This means that you have studied the experiment for the day, have a basic understanding of its purpose and procedure, the chemistry involved and have prepared your laboratory notebook for the experiment prior to the start of lab. I ask that all students do a conscientious and thorough job of cleaning up after themselves, whether it is in their own work area in the lab, or shared areas such as the chemical supply table and balance room.

### **LABORATORY SAFETY**

Laboratory safety is an everyday assignment. ***Being safe in the lab is a top priority.*** The importance of safety in the laboratory will be reviewed the first day of lab. ***Any unsafe behavior, intentional or not, will be noted and may be cause for dismissal from the class.***

For your protection, **safety goggles** with indirect ventilation and an ANSI minimum rating of Z87 **must be worn AT ALL TIMES** in the laboratory. **ONE warning** will be issued to any student that is observed wearing their goggles on their forehead, hanging them around their

neck, etc... instead of wearing over their eyes. If the **warning is disregarded, expulsion** from the lab and a zero on the assignment may result.

### **LABORATORY LECTURE**

The beginning of each laboratory session is designated as a laboratory lecture period for which you **must be on time** in order to perform the scheduled experiment. The instructor will use this lecture period to outline important details of the procedure, overview theory and calculations, and to emphasize safety hazards and proper chemical disposal. *If you are more than 10 minutes late for lab lecture, you will not be allowed to do the experiment for that day.*

### **ATTENDANCE**

Attendance is required at all scheduled laboratory sessions. NEVER plan on missing a lab. **You will receive a zero on the first lab you miss and will fail the course on the second, no matter the reason for the absence.** These absences include those in which you arrive too late for lab lecture and are thus not allowed to complete the experiment. Additionally, do not plan on leaving lab early. Labs will regularly take the total amount of time allotted.

### **CHEMICAL DISPOSAL**

As a concern for the environment and to follow county, state and federal law, proper chemical disposal is essential. *Students who do not comply with directed procedures may be expelled from the lab or failed in the course for repeated offenses.* Check with the instructor if you have any questions.

### **LAB REPORTS**

All lab reports must be completed and turned in to receive a passing grade in this class. **Using another student's data or making up data is plagiarism and data falsification and will result in a zero for the assignment and referral to the dean.** In cases where a student was unable to complete a lab, the instructor may direct you to use another's data in order to complete follow up quests at his discretion. The source of your data must always be cited in lab reports.

### **LATE ASSIGNMENTS**

Due dates for assignments are listed on the class schedule. **Late assignments will lose up to 50% of their value per period missed. (All Labs must still be turned in to receive course credit).** It is the student's responsibility to know when labs are due based on the provided class schedule. Labs are always due the following lab period after the lab session in which they are completed.

### **EXCUSED ABSENCE**

Every student gets one excused absence. To reflect this, your lowest pre-lab, data page, and lab report are dropped at the end of the quarter. Missing a second lab will result in failing the course.

## **Lab Score Breakdown (25% of the course grade)**

### **Lab Prep and Participation (10%):**

You are expected to show up with the lab background and procedure read. In addition, you are expected to fully participate in lab. Unprepared or uninvolved students will forfeit these points.

### **Laboratory Worksheets/Reports (70%):**

Laboratory reports are usually due one week after the completion of the lab. For some experiments you may be collecting and sharing data with a partner, however you must do your own calculations and formulate your own conclusions for each experiment. If students are found to have **copied** from one another, **points will be deducted from the grade or a grade of zero will be given for ALL students involved!** The laboratory assignments will be collected **BEFORE** the start of the laboratory lecture on its due date. Lab reports will consist of worksheets and short writing assignments.

### **Lab Exams (20%):**

There will be a lab exam at the end of this course. It is open lab notebook will cover material and calculations related to your lab experiments. This includes the purpose of each experiment, safety and waste guidelines, the procedure, proper data recording, calculations and theoretical questions related to the technique or purpose of the lab.

### **Safety Rules:**

1. *Prepare for each experiment by reading all of the directions before lab starts.*
2. *Locate the Safety Equipment.* Know the locations of the eye wash, safety shower, fire extinguishers, fire blankets, first aid kit, fume hoods, telephone and all exits that are to be used in an emergency. Your laboratory instructor will describe the use of the safety equipment.
3. *Protect your eyes.* Wear approved eye protection at all times. Your laboratory instructor will inform you which of these you must have. Goggles provide maximum safety. Prescription glasses, if you need them, must be worn under approved eye protection. Contact lenses should not be worn in the laboratory because fumes may accumulate under the lenses and injure your eyes and the lenses make it difficult to flush chemicals from your eyes.
4. *Tie long hair back.* This precaution will keep your hair out of burner flames and harmful chemicals.
5. *Do not wear clothing with loose, flowing sleeves.* This precaution will keep your sleeves out of burner flames and harmful chemicals.
6. *Wear shoes that cover all of your feet.* Broken glass on the laboratory floor and spilled chemical reagents are all too common. Shoes that cover your feet completely will protect them from broken glass and chemical splashes. The best types of shoes are closed-toe made out of leather.
7. *Wear clothes that cover your torso and your legs to the knees.* Clothing will give your body needed protection. Good clothing can be protected with a lab apron or coat.
8. *Do not eat or drink in the laboratory.*
9. *Do not taste any chemical reagent.*
10. *Do not smell chemical reagents directly.* When you are instructed to smell a chemical, do so by gently wafting the vapors toward your face. Do not inhale deeply.
11. *Do not pipette solutions by mouth.* Use a rubber suction bulb to fill the pipette.
12. *Do not work with flammable liquids near a flame.*
13. *Do not engage in games or horseplay in the laboratory.* Never run in the laboratory.
14. *Do not attempt unauthorized experiments in the laboratory.*
15. *Do not work in the laboratory in the absence of your instructor or his or her authorized representative.*
16. *Use a fume hood when required.*
17. *Handle glass tubing and thermometers carefully.* When inserting glass tubing or thermometers through a rubber stopper, always hold the glass close to the stopper and use a lubricant such as glycerin to help the glass slide through the stopper. Do not continue to try to force glass through a stubborn stopper, get a new stopper and/or get help. When inserting a pipette into a pipette bulb, hold the pipette near the bulb and GENTLY insert the pipette.



18. *When diluting, never pour water into concentrated reagents. Always pour the reagent into the water.*
19. *If you spill a chemical reagent on yourself, immediately flood the exposed area with water and then summon the laboratory instructor. Inform the instructor immediately about any other accidents or spills.*
20. *Be aware of your neighbors. Are they obeying the safety rules? A neighbor's accident may injure you.*
21. *Avoid touching your face and rubbing your eyes while in the laboratory. If you must do so, first wash your hands.*
22. *Wash your hands before leaving the laboratory.*
23. *Never heat a closed container. Pressure build up can cause the container to explode.*
24. *Assume any chemical is hazardous if you are unsure.*
25. *Do not violate any other safety rule issued by your laboratory instructor.*

## **Housekeeping Rules:**

1. *Clean up broken glass immediately with a broom and dustpan. Do not use your hands. Dispose of broken glass in the special container that is provided, never in a regular trash can.*
2. *Chemical spills must be cleaned up immediately. Immediately notify your instructor who will advise you how to clean it up and/or assist you. Dispose of the collected contaminated chemical properly as instructed.*
3. *Do not pour any chemical down into the sink or in the trash without authorization. Clearly labeled disposal bottles will be provided when needed.*
4. *Take containers to the stock of chemical reagents. Do not bring stock chemicals to your laboratory bench.*
5. *Read the label on a reagent bottle carefully. Is it the correct chemical? Is it the correct concentration?*
6. *Do not insert your own pipette, medicine dropper or spatula into a stock bottle.*
7. *Use special care with stoppers or tops of stock bottles. Do not allow them to pick up contamination. Your instructor will provide additional instructions for handling the stoppers or tops found in your laboratory.*
8. *Always replace the stopper or top of a stock bottle when you are finished taking some of the reagent. Make sure that you put the stopper or top back onto the correct bottle.*
9. *When pouring liquid from bottles, hold the bottle with the label against the palm of your hand so that the liquid is poured from the side opposite the label. If any liquid runs down the outside of the label, immediately wipe off the liquid.*
10. *Do not take any more of a reagent than is required. Many of the chemicals used in the laboratory, including deionized water, are costly.*
11. *Never return any unused reagent to a stock bottle. If you take too much of a chemical, dispose of it as directed by your instructor or offer it to a classmate who needs it.*
12. *Set up your glassware and apparatus away from the edge of your laboratory bench.*

13. *Thoroughly clean the area around your laboratory bench and the top of your laboratory bench before leaving lab.*

14. *Keep shared areas of the laboratory clean.* This includes areas such as the balance room and where the stock bottles are stored. It is especially important to keep the balances clean and free of chemical spills.

15. *Keep your laboratory equipment clean.* Good results depend on clean equipment.

16. *If a piece of equipment containing mercury is broken, inform your laboratory instructor immediately.* Keep the area blocked off to avoid scattering the mercury.

17. *Follow any other housekeeping rules given by your laboratory instructor.*

## Lab Schedule for Chem 10:

Week	Date	Lab topic	Lab (page #)	Report due
1	4/7	Introduction, Safety, Check in, Scientific Method	1-10	
2	4/14	Lab 1: Taking Measurements	11-18	
3	4/21	Lab 2: Percent Water in Popcorn	27-32	Lab 1
4	4/28	Lab 3: Electron Dot Structures	61-66	Lab 2
5	5/5	Lab 4: Molecular Shapes	67-74	Lab 3
6	5/12	Lab 5: Solutions	75-84	Lab 4
7	5/19	Lab 6: Upset Stomach	113-120	Lab 5
8	5/26	Lab 7: How Much Fat?	31-94	Lab 6
9	6/2	Lab 8: Organic Molecules	135-144	Lab 7
10	6/9	Lab 9: DNA Capture	145-148	Lab 8
11	6/16	Lab check-out + Lab final		Lab 9