

# Chemistry 10

at De Anza College

# Introductory Chemistry



Winter 2016  
Section 03—CRN 32224

Introductory Chemistry is designed to provide non-STEM majors with a general appreciation and broad introduction to the science of chemistry. It meets many GE requirements and is applicable to many non-science programs. This 5 unit course will be taught from 01/04/2016 through 03/25/2016 with a final exam 9:15-11:15 am on Monday 03/21/2016. Lecture and lab meetings will be lead by Prof. Nick DeMello (email [nick@chemlectures.com](mailto:nick@chemlectures.com)).

## 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 the science of chemistry. This semester our class will:

1. Examine the historical development of concepts concerned with the fundamental building blocks of matter - atoms and molecules - and their concomitant effect on our understanding of molecular structure.
2. Assess the importance of the mole concept in stoichiometric calculations.
3. Explore the relationship between the molecular structures of compounds and their effect on the chemical properties of compounds.
4. Explore the contributions of men and women from a variety of cultures and ethnic backgrounds to the field of chemistry.
5. Evaluate ethical issues and environmental effects, from local to global, that have arisen from the extraction, use and disposal of chemicals.

## Prerequisite Preparation:

- Recommended: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273, Math 212

## Required Materials:

- Class textbook. Chemistry for Changing Times, 14e by John W. Hill & Terry W. McCreary. Pearson / PrenticeHall 2015; ISBN-13: 978-0321972026, ISBN-10: 0-321-97202-3 available from the campus bookstore. Other editions **may** be acceptable (ask your instructor if you have an earlier version).
- Online Homework license. Homework and quizzes will be done online using the Pearson Mastering Chemistry system. A license for Mastering Chemistry may be available from the campus bookstore or can be purchased directly at [www.masteringchemistry.com](http://www.masteringchemistry.com).
- Lab manual. Conceptual Chemistry Lab Manual, 5e by John A. Suchocki & Donna Gibson. Pearson Learning Solutions 2014; ISBN-13: 978-0321804532, ISBN-10: 0-321-80453-8 (available from the campus bookstore)
- Internet access (answer keys, worksheets, lecture slides, and other resources will be available only online).
- Laboratory safety goggles (can be purchased at the campus bookstore) are required for all lab experiments.
- A combination pad-lock may be required (if needed, this will be announced in the first lecture).

The following are required and must be brought to every class meeting:

- A spiral bound notebook for doing calculations in class, taking notes, and recording data.
- Pencils (2) with an eraser.
- A simple scientific calculator. The calculator must have scientific notation, log and square root features. Anything more complicated will likely slow you down or result in errors. Keep it simple. Cell phones, PDAs, smart phones, laptops, or other personal electronics devices are **not** an acceptable substitute.

## Structure

### Lecture & Discussion:

Lecture will be held from **Mon & Wed 9:30 am to 11:20 pm (1 hr 50 min) in room S17 building S1**. Lecture attendance is required. You must sign the daily lecture attendance sheet to have your attendance recognized — not signing the sheet is the same as not attending class. Students missing more than two consecutive lectures, more than four lectures in total, or any lectures during the first two weeks of class, may be dropped from the class.

Lectures will parallel the content in the class textbook. Prior to lecture, students are required to read the assigned textbook through the section indicated on the course schedule. Students are encouraged to write down any questions that occur during reading for discussion in lecture and to make note of definitions and formulas introduced in the text. The lecture will assume students have read the assigned sections.

### Laboratory:

Lab meetings will be held **Wednesday 11:30 am to 2:20 pm (2 hr 50 min) in room 2210 building SC2**. Lab attendance is required. You must sign the daily lab attendance sheet to have your attendance recognized — not signing the sheet is the same as not attending class. This is a separate sign in sheet from the lecture attendance sheet. Two or more absences from lab may result in the student being dropped. There are no make-up labs.

Lab meetings will offer students the opportunity to explore many of the topics presented in the course. Each session will involve a separate, predetermined experiment from the class lab manual. Experiments are listed in the class schedule. Students must review the experiment prior to class and complete any pre-lab questions or preparations prior to the meeting. Most lab activities begin with a pre-lab quiz and require a post lab report. Students unable demonstrate proper preparation may not be allowed to participate in that days lab activity.

Most experiments will be done individually. Regardless of whether the experiment is an individual or group project, each student is individually responsible for recording all experimental data, including printing out their own copy of any spectra or other results produced in the lab. Each student is responsible for submitting their own report for every experiment.

Chemistry labs are dangerous. The chemicals we employ and study are interesting because of their tendency to change one substance into another. In other words, almost every chemical you work with is either corrosive, toxic, volatile, combustible or otherwise dangerous. Safety policies required by the college and state will be strictly enforced.

Safety policies include (but are not limited to):

- Safety goggles must be worn at all times in the lab, unless the instructor specifically tells you otherwise.
- Students must wear clothes that adequately cover legs, arms, and feet. No open toed shoes, no shorts, sleeveless shirts, etc.
- No draping or baggy clothing. Long hair must be tied back. Most lab fires start in loose hair or clothing.
- No food or drink is permitted in the lab or in the halls outside the lab. While there is adequate ventilation in the labs for most practices, many foods readily absorb chemical vapors and can quickly become toxic in a lab environment.

A complete list of safety polices will be provided during the first lab period. Students must agree to abide by all safety polices and will be asked to sign a contract to that effect. Students violating that will be asked to leave the lab and may be dropped from the class. At the instructors discretion, points may be removed from the students safety score instead, as a one time warning.

Reports and other assignments are due at the start of the next lab period following completion of the activity, unless your instructor specifies otherwise. Students may submit lab reports only for activities in which they participated. Missed labs will result in zero points for that activity.

### Homework:

Homework problems will be assigned for each chapter. Homework assignments will include questions and calculations similar to those found on the midterms and final exam. Most homework assignments will use the online Mastering Chemistry system. Homework due dates are shown in Mastering Chemistry. You may be able to acquire the required license for Mastering Chemistry when you purchase your lab textbook at the campus book or in can be purchased online at [masteringchemistry.com](http://masteringchemistry.com). The course ID for this class is "CHEM10WINTER2016"

## Exams & Quizzes:

Student understanding of course content will be assessed with quizzes, mid-term exams (3) and a cumulative final exam. Quizzes will usually occur at the start of lab period after some discussion of recent topics covered in lecture. Midterm exams will be held during lecture period, usually in the last hour of that period. A state or campus photo ID is required for exams. The Final exam will be provided according to the colleges final exam schedule, from **9:15-11:15 am Mon 03/21/2016 in room S17 building S1**.

Students are required to bring a scientific calculator, pencils (2), and an eraser to each class and these will be needed for all quizzes and exams. No notes, books, scantron forms, blue books, or other materials are required or will be permitted. A periodic table will be provided when needed. There are no make-up exams or quizzes. Exams and quizzes cannot be taken early. A missed exam or quiz will result in zero points for that assessment. The final exam is comprehensive and is a required assessment. Not taking the final exam will result in a failing grade for the course.

## Grading

There is no curve. There is no extra credit. Final class grades are based on a percentage of total points achieved to total points possible. Points are earned for exams, homework, lab experiments (lab report plus any pre-lab), the lab practical and for lab safety. The total points expected to be offered this semester is approximately 700.

240	Midterm Exams (3 exams; 80 pts each)	34%	Lecture 70%
120	Final Exam (comprehensive; 120 pts)	17%	
135	Homework (9 assignments; 15 pts each)	19%	
20	Laboratory Safety	3%	Lab 30%
48	Quizzes (best 8 quizzes; 6 pts)	7%	
112	Pre-Lab & Reports (best 8; 14 pts combined)	16%	
25	Lab Practical (25 pts)	4%	
700		100%	

Students who achieve 90% or more of the available points will receive an A grade. Students with less than 90% but 80% or more of available points will receive a B grade. Students who earn less than 80% but 70% or more of available points will receive a C grade. Students who earn between 70% and 55% will receive a D grade.

Where allowed by campus policy, a "+" prefix will be attached to B and C grades when a student earns points in the top half of each respective range. Students who achieve less than 55% of the total possible points or who fail to take the final exam will receive a failing grade for the course.

## Resources

### Chem Website 10:

The course syllabus, schedule, topics lists, study guides, worksheets, answer keys and other class resources can be found on the chemistry website for 10 at this URL:

<http://chem.ws/10>

### Office Hours:

Office hours will be Monday 11:30 to 12:30 pm in the STEM Student Success Center (room S-43 of building S4).

### Learning Objectives:

A list of the topics we intend to cover in lecture and lab is provided on the class website, organized by chapter of the class textbook. Specific learning objectives are listed under each topic. Additional topics & objectives may be added during the semester and not all will be tested for on in any given exam or assignment. Students are encouraged to use objectives listed in preparing for lecture, reviewing chapters, getting ready for exams, and determining if this class meets the student's personal goals in studying chemistry.

## Student Success Center:

The Student Success Center offers workshops, tutoring, and support for most De Anza classes. This is a unique and valuable resource. The center offers a great environment for study groups to meet. Students are strongly encouraged to explore and make use of the center.

- Math, Science & Technology Resource Center: S43 / 408.864.8683
- Academic Skills Center: ATC 302 / 408.864.8253
- General Subject Tutoring: ATC 304 / 408.864.8682
- Listening and Speaking Center: ATC 313 / 408.864.5385
- Writing and Reading Center: ATC 309 / 408.864.5840

Hours vary by program. See <http://www.deanza.edu/studentsuccess> for details.

## Notices

### About transitioning into a collegiate environment.

"We teach rose bushes and ivy where to grow. Infants, toddlers, and children are taught right from wrong and other essential lessons. Useful skills, necessary limits, and entertaining tricks are taught to service animals and pets. Teaching is acting upon another to cause them to know something. Out of necessity teaching is generally done without a subject's knowledge, regardless of their consent, and often against their will.

As children become adults, the educational process for them changes. We teach less and ask students to learn more. Required lessons are slowly replaced with opportunities to explore and seek out whatever knowledge a student may choose to make their own. Eventually teaching ends and young adults graduate from even our highest schools, but opportunities to learn may continue. The collegiate environment is not a school. There are no teachers here and enrollment is not required.

If you take this class, you are doing so of your own free will. You are choosing to attempt to master an extremely challenging subject. The faculty and staff of this college will do our best to assist you in your challenge. But passive attendance and simply doing as you are told will not be sufficient. The knowledge proffered here must be taken up, considered, and made your own. You face a difficult challenge. Success is not guaranteed, regardless of effort or intent.

This college also offers you the benefit of having your knowledge tested, graded and certified if you meet a level of mastery determined by the state and college. This certification is not a reward or payment for effort. It is recognition of learning, of what knowledge you succeed in making your own. It is a worthy achievement that few will accomplish. It is something to be proud of."

### Academic Integrity Policy (from the De Anza College Catalog)

*"De Anza College is committed to excellence in the pursuit of learning and academic achievement by its students. To further this goal, the college is committed to providing academic standards that are fair and equitable to all students in an atmosphere that fosters integrity on the part of student, staff and faculty alike. The student's responsibility is to perform to the best of his/her potential in all academic endeavors. This responsibility also includes abiding by the rules and regulations set forth by individual faculty members related to preparation and completion of assignments and examinations.*

*The submission of work that is not the product of a student's personal effort, or work which in some way circumvents the given rules and regulations, will not be tolerated.*

*The following types of misconduct for which students are subject to disciplinary sanction apply at all times on campus as well as to any off-campus functions sponsored or supervised by the college: cheating, plagiarism or knowingly furnishing false information in the classroom or to a college officer."*

The policy in this course is that any student found cheating, plagiarizing, or pursuing any form of academic dishonesty on any assignment will automatically receive zero credit for that assignment. If collusion between students to cheat can be demonstrated, each student will receive this same penalty.

All instances of cheating, plagiarizing, or pursuing any form of academic dishonesty – no matter how small – will be reported to all academic authorities and disciplinary action (including expulsion from the academic program and college) will be fully pursued.

## Student Learning Outcomes

Upon successful completion of this course, a student will:

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

# Topics Presented

(a complete topics with list of objectives is available on the class website)

## Ch 01/02: Science & Matter

Science  
Classes of Matter  
Atomic Theory  
The Mole

## Ch 07: Acids & Bases

Properties  
Models  
pH  
Buffers

## Ch 03: Inside the Atom

Electricity  
Radioactivity  
Subatomic Particles  
Atomic Shells

## Ch 08: Oxidation

Oxidation States  
RedOx Equations  
Common Processes  
Oxidizing Agents

## Ch 04: Compounds

Nomenclature  
Lewis Structures  
Molecular Shape

## Ch 09: Organics

Hydrocarbons  
Functional Groups  
Carbonyls  
Amines & Amides

## Ch 05: Stoichiometry

Molecular Mass  
Chemical Equations  
Concentration

## Ch 10/16: Selet Topics in Polymers & Biochemistry

(as time allows)

Polymers  
Lipids  
Proteins  
DNA  
Structure & Properties  
Synthesis

## Ch 06: States of Matter

Three States  
Condensed States  
Gas State



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			<b>Lecture Section</b> 9:30-11:20 AM — 1 hr 50 min	Textbook Chapter	<b>Lab Section</b> 11:30-2:20 PM— 2 hr 50 min
Week 1	MON	1/4/16	Class Intro & Chemistry (Ch 01)	Ch 01	
	WED	1/6/16	Introducing Atoms (Ch 02)	Ch 02	Check-in / Orientation
Week 2	MON	1/11/16	Parts of the Atom (Ch 03)	Ch 03	
	WED	1/13/16	Atomic Shells (Ch 03)	Ch 03	Exp 01: Taking Measurements (Ch 01)
	SAT	1/16/16	LAST DAY TO ADD A CLASS		
Week 3	MON	1/18/16	MARTIN LUTHER KING'S BIRTHDAY — CAMPUS CLOSED		
	MON	1/18/16	LAST DAY TO DROP WITHOUT A "W"		
	WED	1/20/16	<b>EXAM 01 (Ch 01-03)</b>	Ch 04	Exp 02: Water in Popcorn (Ch 02)
Week 4	MON	1/25/16	Nomenclature (Ch 04)	Ch 04	
	WED	1/27/16	Molecular Shape (Ch 04)	Ch 04	Exp 03: Electron Dot Structures (Ch 04)
Week 5	MON	2/1/16	Molecular Mass (Ch 05)	Ch 05	
	WED	2/3/16	Chemical Equations (Ch 05)	Ch 05	Exp 04: Molecular Shape (Ch 04)
Week 6	MON	2/8/16	Condensed States (Ch 06)	Ch 06	
	WED	2/10/16	<b>EXAM 02 (Ch 04-05)</b>	Ch 06	Exp 05: Solutions (Ch 06)
Week 7	MON	2/15/16	GEORGE WASHINGTON'S BIRTHDAY — CAMPUS CLOSED		
	WED	2/17/16	Gas State (Ch 06)	Ch 06	Exp 06: Upset Stomach (Ch 07)
Week 8	MON	2/22/16	Acids & Bases (Ch 07)	Ch 07	
	WED	2/24/16	ph & Buffers (Ch 07)	Ch 07	Exp 07: Fat Content
	FRI	1/18/16	LAST DAY TO DROP (WITH A "W")		
Week 9	MON	2/29/16	Combustion & Respiration (Ch 08)	Ch 08	
	WED	3/2/16	<b>EXAM 03 (Ch 06-07)</b>	Ch 08	Exp 08: Organic Molecules (Ch 09)
Week 10	MON	3/7/16	Hydrocarbons (Ch 09)	Ch 09	
	WED	3/9/16	Carbonyls & Amines (Ch 09)	Ch 09	Exp 09: DNA Capture
Week 11	MON	3/14/16	Polymerization (Ch 10)	Ch 09	
	WED	3/16/16	Biochemistry (Ch 16)	Ch 10	Lab Practical / Check-out
FINALS	MON	3/21/16	Final EXAM (cumulative) 9:15-11:15 a.m.		

Midterm Exams are in last hour of lecture. There are no make-up Exams, HWes, or Labs. Schedule is subject to change. (rev 20151004 NCD)