

GEORGETOWN UNIVERSITY
Department of Chemistry
General Chemistry I - Summer 2018

General Information for CHEM 001 and CHEM 009

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Office Hours: by appointment	Office Hours: by appointment

Course structure: Lecture/Recitation MTWTh 8:10 - 11:25 AM
Scheduled Quizzes MTWand/orTh 11:00-11:25 AM
Laboratory MTWTh 12:10 - 2:45 PM

Lab, Chem 009, is a separate course. Concurrent registration in Chem 001 and Chem 009 is required, except with permission from the instructor.

Required Books: Chemistry the Central Science 13th Edition by Brown, LeMay, and Bursten

Laboratory Experiments Chemistry the Central Science Custom Edition for Georgetown University by Nelson and Kemp

Online homework through Sapling Learning is also required.
The online homework is worth points toward your grade in the course.

The course will emphasize both assigned reading/problem solving from the textbook and lecture material. Selected handouts will be provided as supplements to the textbook or laboratory manual as required. An online homework program will be utilized to give you more practice answering questions and solving problems.

Objectives: This course focuses on the chemical and physical properties of elements and compounds, the laws that govern their behavior and the theoretical pictures that help us understand this behavior. As well as expanding your knowledge of the physical world, there are three skills you will develop and hone: **Memorization skills** (in order to learn the language of chemistry you need to learn the alphabet, spelling rules and grammar!), **Deductive reasoning skills** (you must apply the information you learn to new problems you have not seen before - this comes from careful interactive study.), **Mathematical problem solving** (we will work on applying your math skills to chemical problems!)

- Examinations:** There will be two exams during the semester and a cumulative final exam. All students are required to take the final exam. The dates for the exams are given on the schedule. There will be **no makeup exams** in this class. If missing an exam is absolutely unavoidable the final exam grade will also count as the missed exam grade. Students who do very poorly on one of their exams, but did not miss an exam, may substitute the final exam grade for the lowest exam grade. Exams will emphasize theory, reactions and problems.
- Quizzes:** Quizzes will be given as indicated on the schedule. Quizzes are very important in helping you gauge your success with the material, learn to work quickly and efficiently on problems, as well as encouraging good study habits. No quizzes will be given outside of scheduled class times, but the lowest quiz grade will be dropped so one missed quiz is not a problem. Quizzes will be challenging in order to properly prepare you for exams.
- Problem Sets:** Problem solving is an extremely important part of the course. The primary goal of the homework assignments is not to provide a grade; most of it will not be collected or graded. The purpose is to guide students to a better understanding of the subject. It is very important to work hard on the problems, as they are the best means to learn the material in the course. Problem solving is a skill that requires practice to achieve success. Students are not prohibited from discussing the problems among themselves; in fact it is encouraged. A student should try each problem her/himself first, but it is important that one learn **how** to do the problems and not just the results of each individual problem. Students should feel free to come to class with questions!
- Online Homework:** These assignments will be worth credit toward your grade in the course. This work is meant to be a learning experience with immediate feedback. The work is graded and recorded by the online program. Online homework is each student's independent work and collaboration is not acceptable.
- Attendance:** Although attendance is not required/graded, it is most highly recommended. Students are responsible for making up any missed work in either lecture or recitation on their own. Makeup sessions are included in the lab schedule. All students that miss a lab must notify the professor in order to attend the makeup session.
- Laboratory:** Students are expected to be prepared for each experiment and obey all safety rules consistently. See the lab guidelines and lab general information handouts for details. Technically the lab is a separate course, CHEM 009. The lab grade is therefore reported to the

registrar separately from the lecture grade. All students registered for CHEM 001 must also be registered in CHEM 009 unless they are excused with permission from the instructor.

Grading:

Chemistry can be a very difficult body of material to master and the last thing you need is the added pressure of competing with each other for grades. My goal is to enable each student to learn as much of the subject matter as they can master. Therefore, the grades will be determined by how the scores fit into a fixed grading system, not how they compare with other scores in the class. There will be no scaling of grades. Note that an A will represent significant achievement, a very difficult, but certainly not impossible accomplishment.

Assessments

Exam I	20 %
Exam II	20 %
Final exam	30 %
Quizzes	20 %
Online Homework	10 %

Given below are the expected ranges for final grades in the course. If your final average is in this range, you are guaranteed at least the grade indicated.

92.5 % and above	A
89.5-92.4	A-
87.5-89.4	B+
82.5-87.4	B
79.5-82.4	B-
77.5-79.4	C+
72.5-77.4	C
69.5-72.4	C-
67.5-69.4	D+
59.0-67.4	D
below 59 %	F

Feedback:

Please feel free to call me at my office, or send me e-mail, any time if you have questions or if you need anything clarified. Obtaining a coherent knowledge of chemistry is one of the first steps toward your goal and I am here to help you in every way possible. So, please let me know how I may serve you best. Work hard and take advantage of all the resources available to you.

GOOD LUCK !!! and **ENJOY !!!**

General Chemistry Lecture I - Summer 2018

Date	Topic	Text
6/04	Introduction; Matter; Units; Significant figures; Density	1.1-1.6
6/05	Atomic structure and mass; Periodic Table	2.1-2.5
6/06	Molecular vs. ionic compounds; Naming compounds Quiz 1 - lecture 1	2.6-2.9
6/07	Balancing equations; Reactions of O ₂ with nonmetals; Formula/Molecular Mass; Percent composition; Mole concept; Empirical formula Quiz 2 - lecture 2	3.1-3.5
6/11	Review for exam I; Practice and problem solving; Stoichiometry Quiz 3 - lecture 3 (Naming compounds)	3.6
6/12	Exam I 8:15 to 10:15 AM Chapters 1-3 (except 3.6 & 3.7) 10:30-11:25 AM Limiting reactant; Percent yield	3.7
6/13	Solutions; Electrolytes (strong, weak, non-); Ionic equations How to predict products of reactions: Metathesis reactions	4.1-4.3
6/14	Oxidation-reduction reactions; Activity series; Practice predicting products Concentration/molarity; Solution stoichiometry Quiz 4 - limiting reactant and percent yield	4.4-4.6
6/18	Thermodynamics; Enthalpy change; Calorimetry Practice predicting products of reactions	5.1-5.5
6/19	Hess's law; Enthalpy of formation; Problem solving Quiz 5 - net ionic equations, predicting products of non-redox reactions	5.6-5.8
6/20	Gas laws; Temperature; Kinetic molecular theory; Ideal gas law Quiz 6 - net ionic equations, predicting products of redox and non-redox reactions	10.1-10.5, 10.7
6/21	Partial pressure; Diffusion and effusion; Non-ideal behavior of gases Quiz 7 - calorimetry	10.6-10.9
6/25	Nature of light; Atomic spectra; Bohr model Review for Exam II; Practice and problem solving Quiz 8 - gas laws (10.1-10.5, 10.7)	6.1-6.3
6/26	Exam II 8:15 to 10:15 AM Chapters 3.6, 3.7, 4, 5, 10 10:30-11:25 AM Wave properties of matter; Quantum mechanics	6.4-6.5
6/27	Orbitals; Electron configurations	6.6-6.9
6/28	Periodic properties; Size; Ionization energy; Electron affinity Quiz 9 - nature of light, photoelectric effect, atomic spectra, Bohr model	7.1-7.6
7/02	Ionic/covalent bonding, Lewis electron dot structures of molecules	8.1-8.8
7/03	Review for final exam; Practice and problem solving Quiz 10 - Periodic properties; Size; Ionization energy; Electron affinity	
7/04	Holiday	
7/05	FINAL EXAM 8:15 -11:15 AM Chapters 6, 7, 8 (70%) and cumulative (30%)	

General Chemistry Laboratory I: CHEM 009-10/12
Schedule of Laboratory Experiments - Summer 2018

The pre-lab assignment for all labs is to complete all "pre-Lab" questions before the beginning of lab and write an outline of the procedure.

Date	Exp. #	Topic	Questions Assigned
6/04	—	Check-in, Tour the lab, and Safety rules Students will purchase a lock and goggles from the chemistry stock room at this time.	
6/05	Q 1	Lab safety quiz Basic Laboratory Techniques (Due 6/07)	1-9
6/06	3	Separation of the Components of a Mixture (Due 6/11)	1-5
6/07	5A I13 (posted on Bb)	Determine the Formula of Zinc Chloride (Due 6/12) How Many Waters of Hydration? Develop Procedure (Due 6/12)	1-6
6/11	—	No lab (if you have missed a lab, you must make it up at this time)	
6/12	—	No Lab	
6/13	6	Chemical reactions of Cu and % yield (Due 6/18)	1-6
6/14	21A	Metathesis Reactions and Net Ionic Equations (Due 6/19)	1, 3, 4
6/18	15	Activity Series (Due 6/21)	1, 3-5
6/19	I12 (posted on Bb)	Heat of Neutralization Procedure (Due 6/20)	
6/20	I12	Heat of Neutralization (Due 6/25)	Formal Report
6/21	S27	Properties of Gases (Due 6/26)	All Questions
6/25	—	No Lab (if you have missed a lab, you must make it up at this time)	
6/26	—	No Lab	
6/27	12 & S5	Atomic spectra (Due 7/02)	5-7 & 1-4
6/28	S15 (posted on Bb)	Determining the Concentration of a Solution: Beer's Law (Due 7/02)	1-6
7/02	—	No Lab/Check out if not enrolled in Chem 002/010	
7/03	—	No Lab	
7/04	—	Holiday	
7/05	—	No Lab	

I12 and I13 stand for "Investigation 12" and "Investigation 13". Both can be found posted on Bb. S5, S15 and S27 are the page numbers for the supplemental experiments supplied at the end of the lab manual (S1-S80 just before the appendices at the very end).