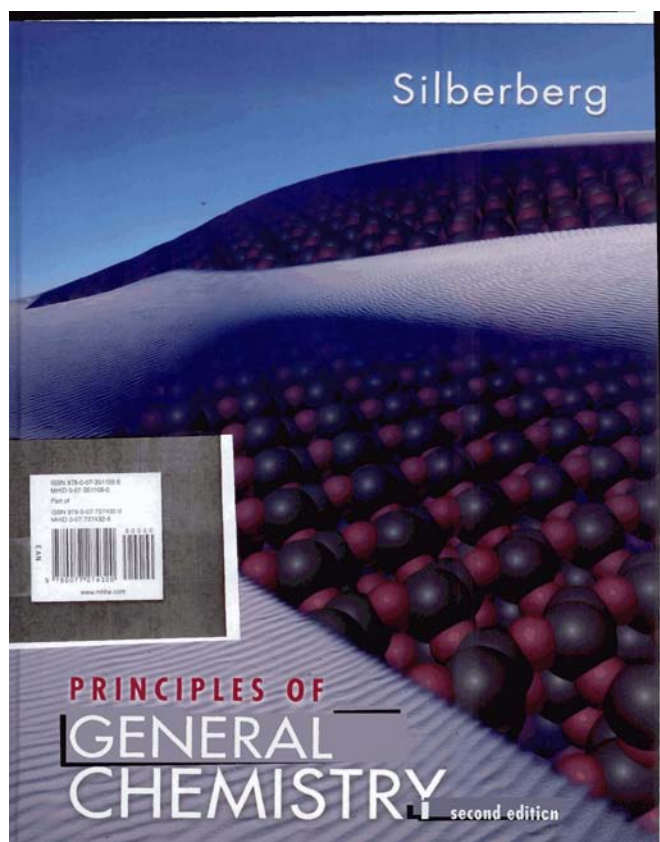


<b>Draft CHM 2045</b>	<b>General Chemistry</b>	<b>Fall 2011</b>
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Sections	Class Period	Instructor	Office	Office Hours
	1, 3, and 7	Mitchell	CLB 214	Office phone 392-0517
				M W F 2 <sup>nd</sup> 4 <sup>th</sup> periods

**TEXTBOOK:** "Principles of General Chemistry", 2nd Edition, Silberberg, McGraw Hill Publishers, 2010  
 ISBN : 978-0-07-351108-5 (New ISBN: cheaper: 9780077999759 this ISBN may only be at the bookstore.)

An electronic copy of the text is available at: <http://www.mcgraw-hill.com.sg/>.



**INFORMATION:** CHM 2045 and CHM 2045L constitute the first semester of the two term sequence of General Chemistry, CHM 2045-2045L-2046-2046L. This sequence is suitable for all science and engineering majors. **To continue into CHM 2046, you must earn a grade of C or higher in CHM 2045 and have MAC 1140, or MAC 1147 or calculus I or the equivalent of these or higher completed.** (Statistics does not count.)

Warning!! If you drop your math class and do not have MAC 1147 or the equivalent or higher you **will not** be able to go on to CHM 2046 even if you pass CHM 2045! Read the Guide to Majors catalog. **This means that you must be taking the math this term or have it show on your transcript. You will be ejected from CHM 2046 at the start of the next term even if the system allows you to register.**

**Schedule: I will follow this schedule very closely and Exam dates will not change!!**

**You cannot take the Final early!**

**Class Schedule (Fall 2011)**

My class times are periods 1 start 7:25, period 3 start 9:35 and period 7 start 1:55 pm

Dates	(MTWR) Topics	Book Chapters
22 Aug. to 26 Aug.	Introduction/ Components of Matter	Chaps.1, 2
29 Aug. to 02 Sept.	Components of Matter/ Stoichiometry	Chap.2 and 3
05 to 09 September	Stoichiometry/ Classes of Chemical Reactions	Chap.3, 4
12 to 16 September	Thermochemistry	Chap. 4 and 6
	12 lectures for exam 1 material	
<b>W 21 September</b>	<b>Exam 1</b>	Chaps.1, 2, 3, 4, 6
26 to 30 September	Quantum Theory (3)	Chap. 7
03 to 07 Oct.	Electron Configuration and Periodicity (3)	Chap. 8
10 to 14 October	Models of Chemical Bonding (3)	Chap. 9
17 to 25 October	Shapes of Molecules (3)	Chap. 10
	Theories of Covalent Bonding (3) 14 lectures for exam 2 material	Chap. 11
<b>W 26 October</b>	<b>Exam 2</b>	Chaps. 7, 8, 9,10, 11
27 Oct. to 02 Nov.	Gases (2)	Chap. 5
03 Nov. to 14 Nov.	Intermolecular Forces and Liquids and Solids (3)	Chap. 12
15 to 18 Nov.	Physical Properties of Solutions (3)	Chap. 13
	8 lectures for exam 3 material	
<b>M 21 November</b>	<b>Exam 3</b>	Chaps. 5, 12, 13
22 Nov. to 7 Dec.	Kinetics (6)	Chap. 16
	6 lectures for final exam material	
<b>T 13 December</b>	<b>Final Exam Start Time 12:30 pm</b>	<b>Comprehensive</b> Chap. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17

**Holidays:** Labor Day (Monday September 5th), Homecoming (Friday 04<sup>th</sup> and Sat. 05<sup>th</sup> November). Veteran's Day (Friday Nov. 11); Thanksgiving (Thursday and Friday Nov. 25 and 26)

**TIPS:** Chemistry is very much a "learn by understanding" subject. Because of this you must work in this course to do well. That means you should read the textbook, work on the website, and do the electronic homework until you understand! Then you should work extra problems (from the book) to test your understanding.

**QUIZZES:** The Quizzes will be taken on-line a schedule will be posted. Five (5) Discussion Quizzes will be given. **No makeup quizzes will be given for any reason.** As with the progress exams, to accommodate unavoidable conflicts, we offer a dropped-quiz policy (the best 4 of 5 quizzes counting toward your grade – see under "GRADES" below). The lowest grade will be dropped, for a maximum total of 100 course points. **We will not have any make up quizzes!!**

<i>Quiz Schedule</i>	
Wednesday, Sep. 7 on Chapters 1,2,3	
Wednesday, Oct. 5 on Chapters 7,8	
Wednesday, Oct. 19 on Chapters 9,10	
Wednesday, Nov. 9 on Chapters 5,12	
Monday, Dec. 5 on Chapter 16	

**DISCUSSION: First discussion will be Tuesday, August 30 or Thursday, September 01 (Tuesday or Thursday) depending on your section number!**

**The first thing you MUST do is find out how to contact your TA so you can get questions answered etc.**

**EXAMS: Three** progress exams and a **cumulative** final exam will be given in the course. All exams will be **given in the evening (8:20 pm start time)** and rooms will be assigned by section number and posted on the Home Page so **learn your section number!** Be on time and bring a calculator (non-graphing) and pencil to the exam room nothing else. **NO NOTES OR INFORMATION SHEETS, NO COMPUTERS, CELL PHONES** or any information storage device electronic or paper.

**No makeup progress exams will be given for any reason.** We have no mechanism with such a large number of students for makeup exams. **Exam dates are clearly indicated on the syllabus and no excuse (none of any kind) will be accepted for not taking the exams on the scheduled date and time.** Final Exam may not be taken early **so don't ask!** Grades will be posted within 24 hours most of the time. Should you not see your grade on e-Learning it is YOUR responsibility to inform me. **If you do not inform me prior to the next exam I will not be understanding.** Students may NOT use graphing calculators on exams, you must use a scientific calculator with exponents and log and ln functions. No other device may be used as a calculator i.e. cell phone, iPods etc. **Calculator dies during the exam, no do-over. I suggest you bring a spare.** No cell phones are allowed in the exam rooms. **We do not curve exams so don't ask.** Sample progress exams will be posted.

## Student Responsibilities:

- 1. You are required to attend all classes and discussions. (No you don't get points for doing what you are supposed to like coming to class.)** You don't show to class it is up to you to find out what you missed. You are responsible for everything I say in lecture even if you don't come. Read the syllabus and check the online notes do not expect me to repeat a lecture. I have my class video recorded, how to access the videos will be posted. **DO NOT** depend on reviewing these the day before exam or use this as an excuse for not attending class. Note: The quality of the recording is not very good.
- 2. You are required to read and follow the syllabus it is a grading contract.** You fail to comply and you will lose the points!
- 3. You must make check Sakai on a weekly basis to make sure all your grades are posted or if an announcement is made, or if something is wrong you must get with the instructor. Come see me for missing electronic homework and exam grades and do so promptly. If you wait till after the course ends I will not help you! The last day of the course is the last time I will put in a missing grade!**
- 4. Exam grades are posted promptly, usually within 24 hours. So, if yours does not show see your instructor. Scantron errors are not negotiable. This includes Form Code errors, registry errors, name and UFID numbers to name a few. If you wait until the last few days of the semester to discover an incorrect grade you may lose points. DO NOT WAIT TO POINT OUT A MISSED GRADE! If you come to me after the last day of class you will lose the points no discussion.**
- 5. You must work "lots of problems", lots is different for everyone. These include end of chapter problems, problems on the notes / power point slides I have posted. Do not come to me with I did all the problems you said but still failed the exam. You take 20 minutes to do a problem at home but on the exam you have only 5 minutes to do the same problem. If you can't work a problem in 5 minutes you did not do enough problems!**
- 6. You must keep up with the lecture material, the on line homework and quiz material. All due dates are on the syllabus or the course home page so you have no excuse what so ever for missing or not knowing a due date. At first you may know the material and think you can slack off, don't do this it will harm your grade. Keep working, things happen fast here and once you get behind you may not be able to catch up.**
- 7. You are responsible for your personal problems. Your problem(s) no matter how valid they are do not constitute an excuse or exemption from meeting the course requirements. Have a problem that stops you from performing then YOU must go see the Dean of Students, they can help you.**
- 8. Do not e-mail me, do not voice mail me, and do not leave notes for me. (Why? Because I have over 1800 students and cannot handle e-mail from that many students!) All e-mails will be deleted unread. If you want me to do something for you then you come find me. Office hours will be posted on the course home page and on my office door.**
- 9. If you need help get it early, help is available. The Chemistry Learning Center in Flint 257-278 it will have graduate students to assist you. A schedule with TA names and their times in the CLC will be posted on the course home page.**
- 10. Learn how to fill out a scantron. Scantron errors are not negotiable. This includes Form Code errors, registry errors, and name and UFID numbers. Make it hard for me to post your grade and you will lose points. You WILL BE penalized for scantron errors that require me to do extra work to get your grade into the e-learning grade book. First offense 9 points, second offense 18 points, third offense 24 points and fourth offense 36 points. It pays to learn how to fill out a scantron properly. A copy of a scantron is below.**
- 11. If you want to see your scantron you MUST come see me within 3 school days of the exam. They will not be e-mailed or given to a second party. Do not come after that time.**
- 12. Need an interview for First year Florida I will have a schedule and do them only on those few days.**

## SCORING:

Your grade for the term will be determined as follows:

Progress Exams (best 2 of 3@ 250 pts each)	500
WEB Assign homework (\$35)	80
Quizzes (best 4 of 5 @ 30 points each)	120
Final Exam	300
TOTAL	1000 pts

**Grades will not be curved.** The following grade cutoffs will be used: This is fixed; points **will not** go up. We are now using minus grades so your grade will be based on the scale below. Off by one point you get the grade you earned.

A = 900	B - = 760	D + = 630
A - = 860	C + = 730	D = 600
B+ = 830	C = 700	E < 600
B = 800	C - = 660 Failing grade	

**On-line Homework:** Sections of WEB Assign will be assigned regularly. The points you see on Sakai will be your course **Web Assign points, max 80**. WEB Assign points will be up dated on Sakai several times during the semester, usually when exam grades are posted.

**Each posting is the new total of the points you have. Keep up with your WEB Assign grade and know your due dates. If you wait till after the classes end to discover a grade is incorrect you will lose points. We will not reopen up or extend the dates just because you missed the due date. You have several days to complete each WEB Assign assignment. Do not wait till the last minute to do your assignments! Computer and server problems are yours and will not be considered.**

**Sakai:** To access Sakai you should go to the website: <http://lss.at.ufl.edu> . Choose “Sakai”, then “University of Florida”. To log in, you must use your GatorLink username and password. If you do not yet have one, you must obtain one. If you have any problems with your GatorLink name or password you should contact the Help Desk at 392-HELP, or go to 520 CSE. They will only help you with GatorLink items, not WebCT problems. For the latter, see your instructor.

**WEBASSIGN (ON-LINE) HOMEWORK:** You must purchase Webassign it is NOT included with the text. WebAssign assignments for each textbook chapter will be due on the dates listed in WebAssign – times due for each due date are just before midnight. Do NOT wait until the last minute to access and attempt to complete WebAssign assignments, because computer issues can arise at any time, and you don’t want to be left at the last minute not being able to complete your assignments on time due to some technical error.

To access WebAssign, if you do not already have a WebAssign account set up, go to <https://www.webassign.net/login.html> and use the following:

username = your GatorLink username

institution = ufl

password = 2045 (or if you have a WA account use the password you have.)

**WebAssign Access;** You will have to buy the access from the web site (something like \$35 for the semester). You’ll have about 10 days “free”(it is not free for the term, you will have to purchase Web Assign at some point) of WebAssign usage once you access the site using the class-provided login information, after which you’ll have to purchased access either on-line or in the bookstore.

Correct answers to WebAssign assignments require very precise attention to significant-figure rules – if you do not fully understand the usage of significant figures, you should read pages 22-24 in your textbook (or another source for detailed significant-figure instruction). Also, the correct answers to WebAssign assignments have very narrow acceptance windows – you must be very careful in the numbers you use for calculations and how you carry them through the problem-solving procedure. Finally, you'll notice that many of the WebAssign problems have information next to the problem number (things like “EOCP” which refers to Silberberg EndOfChapterProblem such-and-such, so that you can consult the Silberberg textbook problem and the posted online solutions to find out how the problem is solved if you have any difficulties). The WebAssign User Guide is at <http://www.webassign.net/guide/index.html> and the WebAssign Student Technical Support is at <http://www.webassign.net/info/support/report.html>

**HONOR SYSTEM:** All exams are given under the Honor System. Any student caught cheating will receive the maximum punishment I can bring to bear. (Cheating of any kind will result in a grade of E.) Check the website for the UF policy on honesty and cheating: [http://www.dso.ufl.edu/stg/Code\\_of\\_Conduct.html](http://www.dso.ufl.edu/stg/Code_of_Conduct.html)

**CHEMISTRY LEARNING CENTER (CLC):** There is free help to be had from graduate student teaching assistants in the CLC Monday through Friday in Flint Hall 257 and 258. Your discussion TA will have office hours in the CLC, but you may go there anytime and see any TA to get help on questions pertaining to chemistry. A schedule of the TA schedules will be posted in the corridor outside the CLC and on e-Learning.

**The CLC ends their office hours the last day of class and I end my office hours then as well.**

**Other Information:**

Honor Code: <http://www.chem.ufl.edu/~itl/honor.html>

Disabilities: <http://www.chem.ufl.edu/~itl/disabilities.html>

Counseling: <http://www.chem.ufl.edu/~itl/counseling.html>

**STUDENT ATHLETES and SCHOOL EVENTS: You must see me in person each and every time about taking a graded event outside posted times that means early never late.**

**DISABILITY RESOURCES:** Disability resources students must see me the first week of class. If you are applying for disability resource status come see me the first week of class. Students requesting classroom and exam accommodations must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Students will then go to the disability resource center.

The Dean of Students Office provides individualized assistance for students with documented disabilities. Services are based upon student need and impact of their specific disability. There is no requirement for any student to self-identify as having a disability. However, students requesting classroom accommodations must register with the Dean of Students Office and provide the appropriate documentation verifying their disability. The Dean of Students Office determines what is and is not appropriate documentation. Examples of accommodations that are available to students include, but are not limited to, registration assistance, approval of reduced course load, course substitutions, classroom and examination accommodations, auxiliary learning aids, additional course drops when disability related, and assistance in other university activities. The designated coordinator for compliance with Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) is the Assistant Dean of Students responsible for Students with Disabilities Programs, P202 Peabody Hall, 392-1261 (Voice), or 392-3008 (TDD).

The Disability Resource Center strives to provide quality services to students with physical, learning, sensory or psychological disabilities, to educate them about their legal rights and responsibilities so that they can make informed decisions, and to foster a sense of empowerment so that they can engage in critical thinking and self-determination.

## **Course Objectives: CHM 2045 (General Chemistry I)**

To build a basic fund of knowledge of the science of chemistry covering the topics below:

To analyze scientific concepts and think critically.

To review the importance of chemistry in our everyday lives.

To be able to utilize the methods of science as a logical means of problem solving.

### **The Foundation of Chemistry**

Matter and Energy-Basic Concepts of Chemistry

Measurements

Significant Figures

Metric System

Scientific Notation

Dimensional Analysis

### **Chemical Formulas and Stoichiometry**

Atoms, Ions, Molecules and Compounds

Nomenclature of Inorganic Compounds

The Mole Concept

Percent Composition

Empirical Formula

Molecular Formula

### **Chemical Equations and Reaction Stoichiometry**

Balancing of Chemical Equations

Calculations Based on Chemical Equations-moles/masses of reactants/products

Limiting Reagent Calculations

Percent Yield and Theoretical Yield Calculations

Sequential Reactions

Concentration of Solutions-Calculations Involving Mass % and Molarity

Dilution of Solutions: Calculations Involving  $V_1M_1=V_2M_2$

Calculations Involving Solution Stoichiometry

### **Chemical Reactions**

Organization of the Periodic Table

Aqueous Solutions-Strong and Weak Electrolytes

Reactions in Aqueous Solutions

Oxidation Numbers

### **Thermodynamics**

The First Law of Thermodynamics

Enthalpy,  $\Delta H$

Calorimetry (constant-pressure and constant volume)

Thermochemical equations

Internal energy,  $\Delta E$

Relationship between  $\Delta E$  and  $\Delta H$

Hess' Law

Standard enthalpies of formation and reaction

Bond energy and  $\Delta H$

The Second Law of Thermodynamics & Spontaneity

## **The Structure of the Atom**

Experiments that led to the discovery of the fundamental particles of the atom  
Subatomic Particles, Isotopes, Atomic Weight  
Development of Quantum Mechanics  
Quantum Mechanical Model of the Atom  
Electronic Configuration and the Relationship to the Periodic Table  
Orbital Diagrams  
Quantum Numbers  
Chemical Periodicity

## **Theory of Ionic and Covalent Bonding**

Lewis Dot Formulas of Atoms  
Formation of Binary Ionic Compounds-Coulomb's Law, Lattice Energy  
Formation of Covalent Compounds  
Lewis Structures for Molecules and Polyatomic Ions and the Octet Rule  
Resonance and Formal Charges  
Exceptions to the Octet Rule for Lewis Structures  
Polar and Nonpolar Covalent Bonds

## **Molecular Structure**

Valence Shell Electron Pair Repulsion Theory (VSEPR)  
Electronic and Molecular Geometry and Molecular Dipole Moments  
Valence Bond Theory and Hybridization of Orbitals  
Molecular Orbital Theory

## **Gases**

Gas Laws and Ideal Gas Law  
Density and Molar Mass  
Stoichiometry of Reactions Involving Gases  
Kinetic Molecular Theory-Molecular Speeds  
Real Gases

## **Liquids and Solids**

Intermolecular Attractions and Phase Changes  
Physical Processes and Properties of Liquids  
Melting Point/Boiling Point  
Phase Changes of Matter and Phase Diagrams  
Molar Heat of Vaporization and Molar Heat of Fusion

## **Solutions**

Dissolution Process for Solids, Liquids and Gases  
Factors Affecting Solubility  
Saturated, Unsaturated and Supersaturated Solutions  
Other Units of Concentration  
Colligative Properties

1. Vapor Pressure Lowering
2. Boiling Point Elevation
3. Freezing Point Depression
4. Osmotic Pressure

## **Chemical Kinetics:**

- Rate of a reaction  
Factors that affect reaction rates
- a. Nature of reactants
  - b. Concentration of reactants: Rate-law expressions & Reaction order
  - c. Concentration vs. time: Integrated rate equations and half-life



Collision theory, activation energy  
Transition state theory  
Mechanisms and Rate-law expressions  
Arrhenius equation: temperature and rate  
Catalysts

### **Chemical Equilibria**

Dynamic equilibria  
Equilibrium constant  $K_c$   
Reaction quotients  
Calculations with  $K_c$   
Heterogeneous equilibria  
 $K_p$  and  $K_c$   
Le Chatelier's Principle: factors affecting equilibria

LAST NAME										FI	MI
A	A	A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C	C	C
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G	G	G	G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K	K	K	K
L	L	L	L	L	L	L	L	L	L	L	L
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Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z

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CHM  
2045

UF ID										SECTION			
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