

CHEMISTRY 117 A - GENERAL CHEMISTRY 2
SPRING 2018
Lecture 9 am MWF, A1 Lab 8 am R, A2 Lab 4:00 T
FSC 370 FSC 313

Instructor

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 Office Hours: 1-2 MTWRF or by appointment

I believe the information in this syllabus is accurate, but reserve the right to make corrections as needed.

Class Schedule

Lecture A 9:00 - 9:50 MWF FSC 370
Lab A1 (DEW) 8:00 - 9:50 R FSC 313
Lab A2 (Johnson-Edler) 4:00 - 5:50 T FSC 313

Text & Supplies

Continuation of Chem 116 - same text and lab manual.

General Chemistry: Atoms First McMurry and Fay, 2nd ed, Pearson (ISBN 13: 9780321809261 text only). You will NOT need a Sapling access card.

Laboratory Experiments for General Chemistry Labs, 2017-18 edition (lab manual) - same as for Fall 16 Chem 116, available from Marlys in the Physics/Natural Science Division Office (FSC 390), cost is \$20.

Preparing for Your ACS Examination in General Chemistry - The Official Guide - recommended. Purchase on-line at <http://uwm.edu/acs-exams/students/student-study-materials/>. SMACS (Chem Club) often coordinates purchase for the class.

There are also several copies also on reserve in the library.

Permanently bound lab notebook with duplicate pages (carbon or carbonless) (available in the Bookstore).

Safety Goggles with complete splash guard (available in the Bookstore). Unused pages in a notebook from a previous course can be used in this course.

Scientific Calculator with log and 10^x (antilog) functions - **Programmable (graphing and/or alphanumeric) calculators and cell phone calculators are NOT allowed on exams.**

Grading Criteria

POSSIBLE POINTS		GRADING CUTOFFS	
Exams (4)	400	A - A-	1000 - 930 - 900
Chemistry in Action Reports (5*25pts)	125	B+ - B - B-	870 - 830 - 800
Labs (11 * 25pts)	275	C+ - C - C-	770 - 680 - 650
ACS Final Exam	200	D+ - D - D-	620 - 580 - 550
TOTAL	1000	YOU CANNOT PASS THE COURSE UNLESS YOU PASS THE LAB (151 PTS OUT OF 275)	
Late assignments penalized 20%		Borderlines will be assessed on a case by case basis.	
No assignments accepted after 5 pm on the last day of classes			
Last day to drop or change to S/U is Friday, Apr 6			

GENERAL GOALS AND EXPECTATIONS**Catalog Description**

The second course in general chemistry at the college level. The course serves as a prerequisite for other courses. The main conceptual areas of emphasis of the course are kinetics, equilibrium, acids and bases (including buffers), thermodynamics, electrochemistry, solids and materials, coordination chemistry.

Student Outcomes

- Demonstrate an understanding of some basic chemical concepts (e.g., kinetics, equilibrium, acids and bases (including buffers), thermodynamics, electrochemistry, solids and materials, coordination chemistry) and their impact on human lives.
- Use your understanding of concepts from this course and Chem 116 to predict behavior and explain interactions and relationships.
- Correlate macroscopic properties and measurements with what's happening on the atomic/molecular level.
- Develop and demonstrate problem solving/critical thinking skills using the concepts covered in this course and Chem 116, expressing results with appropriate significant figures.
- Practice team skills through work in small groups.

- Acquire basic lab skills and perfect lab skills learned in Chem 116, with specific attention to:
 - Taking an active role in the lab while experiencing hands-on illustrations of concepts covered in lecture.
 - Learning proper use of equipment and proper execution of techniques used in chemistry with attention to safety issues.
 - Following directions (written and oral).
 - Continuing to develop the fundamentals of keeping a notebook (careful observations, recording all data, organization of data for easy interpretation) and reporting results.

Moodle

Syllabus, other handouts, any powerpoint presentations used in class, answer keys to exams, and other information files for this class will be posted on Moodle under **CHEM 117 A1 A2 SP18**. The grade book will be updated after each exam so you can check that grades are recorded correctly and see how you stand (See also Guide to Moodle Gradebook on the course Moodle site). You are automatically enrolled in Moodle when you register for this course.

Use the appropriate Moodle drop boxes to submit electronic files when they are required. All spreadsheets must be in Excel format (.xls or .xlsx) and other documents must be either .pdf or Word (.doc or .docx). Use SaveAs or Export to generate these formats from other programs.

The Chemistry Department is transitioning to using Moodle to present prelab lectures and a prelab quiz. This information will be on Moodle under **CHEM 117 Pre-Lab**. You will be given more information on when and how to use this Moodle course.

COURSE POLICIES

Attendance

It is expected that you will be in the lecture or the laboratory! If you miss a lecture, YOU are responsible for finding out about any announcements, handing in assignments, obtaining class notes from a classmate, etc. Absence from laboratory or examinations will be excused only because of *illness or family emergency*! An unexcused absence will result in a '0' for the work missed. For lab conflicts consult early, you can often join another lab section if there is enough advance notice. If you participate in sports, make sure I have a schedule that includes projected travel times. Be especially cognizant during registration week - if registration and lab times overlap and you don't plan ahead, plan to be in lab and register at a later time.

Late Work Policy

Late work will be accepted at any time before 5 pm on the last day of classes. Late work will be docked 20%.

Communication with the Class

The instructor will use your Augie email addresses (@ole) for class announcements and general communication with the class and with individuals; check your email daily. Email is sometimes erratic, so I will respond to every message you send. If you don't get a response in a day or two, send your message again. **DON'T SEND MESSAGES THAT CONSIST OF ONLY A LINK OR ATTACHMENT; provide a line or two of context to distinguish them from spam.** See the Help Desk (Madsen Basement) for details on accessing your email. If you use another email account, put a forwarder in your @ole account (contact the Help Desk for help in setting up a forwarder).

General Guideline for All Work Submitted

- **NO WORK, NO CREDIT!!!**
- Give **evidence** of your thinking process on all work:
 - **show calculations in logical steps** that someone else can easily follow.
 - **explain your reasoning** on all questions.
- Strive for explanations and thinking that relates the observable to the characteristics and behavior of atoms and molecules, i.e. relate the macroscale to the nanoscale.
- When expressing decimal numbers that are less than one, include a zero before the decimal point (0.315 cm, not .315 cm or 0.315 with no label)
- Don't round off until the last step.
- Express answers to the correct number of significant digits and include units (labels).
- Show charges on all ions.

UNIVERSITY POLICIES

Accessibility

Augustana welcomes students with disabilities to participate in all of its courses, programs, services, and activities. If you have a documented disability and are requesting accommodations, please contact Susan Bies, Director of Accessibility and Academic Support. Her office is located in the Student Success Center (Edith Mortenson Center, Suite 100) and she may be reached at 605-274-5503 or susan.bies@augie.edu.

Chemistry, by its very nature, involves handling of potentially hazardous substances. The labs in this course will teach you how to handle these substances properly while minimizing the range of exposure. However, exposure effects vary from person to person. So, if you have asthma, allergies, are pregnant, or have other special circumstances, please inform your lab instructor so we can plan appropriate accommodations for your safety.

Honor Code

As a community of scholars, the students and faculty at Augustana University commit to the highest standards of excellence by mutually embracing an Honor Code. The Honor Code requires that examinations and selected assignments contain the following pledge statement which students are expected to sign:

“On my honor, I pledge that I have upheld the Honor Code, and that the work I have done on this assignment has been honest, and that the work of others in this class has, to the best of my knowledge, been honest as well.”

Faculty members are responsible for investigating all instances involving any student who does not sign the Honor Pledge or who bring forward an academic integrity concern. The complete Honor Code can be found at www.augie.edu/honor.

What does this mean in this course?

- ▶ You do your own work on individual assignments (not copying others). On group assignments you contribute to the group effort and strive to understand all parts of the project, not just the part you do.
- ▶ In lab you are “true” to your data - your report reflects what *you* measured and observed; data is not changed or manufactured to fit expectations. If you missed collecting some data, see the instructor; don’t copy someone else’s data.
- ▶ Give credit where credit is due. When you gather data from the Web, books, magazines, etc. cite the reference (author, title, etc.).

I presume we are in this class to help each other learn some chemistry (yes, instructors learn in this class too), so I trust you to turn in work that reflects your efforts and also, that as individuals and in your small groups, to help each other adhere to the **Honor Code**. The above statement will be appended to each exam and *you should add it to each assignment* (Word file on Moodle):

If you cannot, in good conscience, sign this pledge or if you have other concerns about academic integrity in this course, please come visit with me (in confidence of course) or send me an e-mail note. At a minimum, students caught violating this code will receive a zero (0) on the assignment or exam and the incident will be reported to the Academic Dean in accordance with the **Honor Code** procedures.

Commitment to Diversity

Augustana University is committed to creating and fostering a learning and working environment based on open communication and mutual respect. This is an integral part of the academic mission to enrich our students' educational experiences and prepare them to live in and contribute to a global society. If you encounter sexual harassment, sexual misconduct, sexual assault, or discrimination please contact the Title IX Coordinator at 605-274-4044 or belam@augie.edu. If you make a report of this nature to a faculty member, they must notify the Title IX Coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about options at Augustana, please visit www.augie.edu/titleix.

RESOURCES BEYOND THE TEXTBOOK

Feel free to consult with the **instructor** concerning any problems or questions you encounter in the course or about Augustana. Office hours each week are listed above, but I will be glad to help you at other times as well. Making an appointment will (usually) guarantee that I will be available, but it is not necessary, drop in any time. You may also communicate questions or concerns via e-mail to the instructor.

Tutors for all courses are coordinated through the Success Center and are available at no cost. Schedules for the semester and other tutor information is available at <http://www.augie.edu/tutoring-augustana>. Spring 18 starting on Sunday Feb 4, there will be tutors in FSC 370 Sunday-Thursday evenings from 7-9 pm.

Class Website (faculty.augie.edu/~dew) also accessible from the Chemistry Department Home Page, provides the syllabus, some of the handouts, old exams, and links to a number of chemistry related sites.

A **Chem 117 Study Guide** accessible on Moodle and the class website outlines each chapter to be covered, highlighting the important material and concepts to help you focus your study time.

COURSE ACTIVITIES DETAILS

Hour Exams

4 hour exams (100 pts each) will be given as scheduled (see lecture schedule below) during the regular lecture period. If you have to miss an exam, please notify the instructor, preferably before the absence. If you have an acceptable excuse for missing an exam and the exam cannot be rescheduled conveniently before the exam is returned to the class, more weight will be placed on your final exam to cover the missed exam. **No phones or programmable (graphing or alphanumeric) calculators are allowed during exams.**

Hour exams offer a periodic opportunity for you to demonstrate your understanding of the material. Consistent with the nature of chemistry, each exam will be somewhat comprehensive, with material taken from what has been covered to date, as well as lab and safety material. A chapter by chapter **Study Guide** is provided on Moodle and the class website. Before each hour exam, we will review the outline of the chapters to be covered on the exam so you can plan and focus your study time. In addition, examples of past exams from Chem 117 and Chem 120 (120 covered more topics, some in less detail) are available on the class web site. The table at the end of the **Study Guide** lists equations and constants that will be supplied on all exams.

Final Exam

The **final exam** (200 pts) is one last opportunity for you to demonstrate that you have mastered the material presented in this class. An ACS full year General Chemistry exam (standardized exam that covers Chem 116 and 117) will be given during the final exam period. An ACS publication *Preparing for Your ACS Examination in General Chemistry - The Official Guide* will be helpful in preparing for this type of exam and for hour exams. SMACS (Chem Club) often coordinates purchase for the class, but you can purchase a personal copy on-line at <http://uwm.edu/acs-exams/students/student-study-materials/> or use one of the copies on reserve in Mikkelsen Library. *The Study Guide is copyrighted material, so making a xerox copy of those on reserve is not an appropriate strategy.*

A practice exam and its answer key assembled from retired ACS exams is available on Moodle. This is not fully equivalent to the exams you will take, but it serves as a study aid in preparing for the ACS exams. In addition during the last lab period, you will have the opportunity to practice using an older version of the ACS exam. This opportunity will be for practice only, it will not count toward your grade.

Since the final represents a recap of the entire semester, it may also be used to **improve the score on your lowest hour exam**. It works like this: if you score a higher percentage on the final than on a previous exam, or if you missed an exam, then the final exam score will replace that exam score.

Each ACS exam has a multiple choice format, 70-75 questions, and about 2 hour time limit. The list of equations and constants provided on other exams is also provided for ACS Exams. Points for the ACS Exams are scaled to the national norms.

Homework

Working problems, not just watching someone else do it, is essential for learning chemistry, so problem solving should be a regular and significant part of your study time for this course. To help you focus on appropriate problems, a set of recommended problems relating to the key concepts in each chapter are included in the Study Guide. These problem assignments are for your benefit and will **NOT be collected or graded**. Worked out solutions for the problem sets are posted on Moodle. There are 100 or so recommended problems; over the course of the semester, this amounts to working about ONE or TWO problems per day. Pace yourself and take good advantage of these opportunities to **think chemistry**.

Chemistry in Action Reports

An important aid to learning is to see concepts expressed in several ways and in a variety of contexts, particularly as applications in familiar settings. In the **Chemistry in Action Report** you will seek out these connections. There will be **5 reports** throughout the semester worth 25 points each; each one due at 5 pm on the class day preceding each hour exam and on the last day of classes. **Small groups** (up to 3 students) who work on the report together may turn in a single copy, with all group members **signing** the Honor Pledge.

***EACH* Chemistry in Action Report** includes a printed copy that includes a signed *Honesty Pledge*, your response to each of the two chemistry articles, a summary of the article on a scientist, and a **complete** reference for each article. Drop electronic copies of the three articles (.pdf, .txt, .html, or Word format) in the appropriate Activities box on Moodle.

Format for *each* Chemistry in Action Report:

- ▶ Make the Honesty Pledge the first page (no other cover page), print name(s) and date as well as signature(s).
- ▶ **TWO** articles or advertisements from a newspaper, magazine, periodical, etc. that relate to the chemistry.
 - ▶ It is not restricted to the current unit.
 - ▶ Choose publications aimed at the general public, **not** chemistry specific journals.
 - ▶ If you use the Web make sure you locate the full article, not just an abstract.

- ▶ For each of the two chemistry items, write a 1-2 paragraph **response** that demonstrates that you have thought about the content. **THE RESPONSE MUST CLEARLY BE MORE THAN A SUMMARY.**
 - ▶ Response may include your reasons for choosing that article, your feelings about the information presented or the way in which it was presented, your view on the issue, questions that arise concerning the article, etc.
 - ▶ Describe the connection to the course material if it is not obvious.
 - ▶ Keep in mind that anyone can put anything they want on the Web, there are no controls to guarantee scientific accuracy or even a scientific basis.
 - ▶ Also keep in mind that “cutting edge” science is science that is not well understood yet. It is common for experts to disagree on these issues; in fact, discussions over disagreements often raise the questions targeted by future research which ultimately leads to a clearer understanding.
- ▶ **ONE** article from a reference other than your textbook about one of the chemists (a person) we have encountered this semester. Summarize this article. This item is not restricted to the current unit.
- ▶ Just *below* each response/summary, provide a **full** reference to the article (give credit where credit is due). Include enough information for someone to locate that article down to the exact page. References should conform to the formats given below. NOTE: a URL alone is **not** a complete reference.
 - ▶ If the article appeared in print but you located it by a Web search, give the full print citation **AND** the full URL you used to locate it.
 - ▶ For *periodical articles in print*, the format should be: Author(s). Title of article. Journal abbreviation. year, volume, inclusive pages. Example: Wysocki, J. LCGC 2001, 19, 1150-1159.
 - ▶ *Online periodical articles* have a similar format with a couple additions: Author(s). Title of article. Journal abbreviation [Online] year, volume, pages, and the complete URL. Example: Wysocki, J. LCGC [Online] 2001, 19, 1150-1159, www.lcgcmag.com/lcgc/data/articlestandard/lcgc/482001/2674/article.pdf.
 - ▶ For *books*: Author1; Author2 Chapter Title. Book Title, Edition Number; Publisher: Place of Publication, Year; pages. Example: Willard, H. H.; Merritt, L. L., Jr.; Dean, J. A.; Settle, F. A., Jr. Chapter 2. Instrumental Methods of Analysis, 6th ed.; Van Nostrand: New York, 1981; 158-231.
 - ▶ For *Web pages*, the citation format should be: Author, if available. Title of page as listed on the site. Address of page (date accessed). Example: Hsu, D. Chemicool Periodical Table. www-tech.mit.edu/Chemicool/ (accessed Jan. 5, 1999). (*A URL alone is not a sufficient reference*).
 - ▶ NOTE: Browsers usually include the URL at the top or bottom of the page when you print the page. However, if it is a long URL, it will often be abbreviated by using ... somewhere in the string to show that something has been left out. In those cases, get the *full* URL from the Location box in the browser window.
- ▶ Drop electronic copies of the three articles (.pdf or Word format) in the appropriate Activities box on Moodle. *Be sure the file name for the electronic copy includes an assignment identifier and partners initials e.g., CIA 2 art3 AJ HR.*
 - ▶ No links or shared files. (I don't have time to follow links for the whole class.)
 - ▶ Capture the web pages as a file - either as a pdf (print to a pdf converter - there are many free converters available), as a text or HTML file (use the browser's File/Save As, and select the type - text won't look pretty but the info will be there).

Laboratory

Lab provides the opportunity for you to gain hands-on experience with the concepts encountered in class and to learn proper and **SAFE** lab techniques. **LAB WORK** is permitted only during the scheduled lab periods. The schedule of experiments is found on the last page of this syllabus. If you must miss a lab, see the instructor promptly (preferably before the absence). In general, only students with **EXCUSED** absences (mainly illness or family emergency) will be allowed to make up missed labs.

On some labs you will work alone and on others you will work in groups of two. On the partner labs, share duties in the lab so both are involved in the experiment - learn by doing, not by watching. Also on partner labs, **each** person will keep a **complete** notebook.

Details for recording data in lab and writing the lab report are given in the lab manual. Each student submits a Safety and Reactions Report due at the beginning of the period the experiment is conducted and a Lab Report at the beginning of following lab period. Partners may work together on the calculations, but each student writes a conclusion. Labs are worth 25 points each. **YOU CANNOT PASS THE COURSE UNLESS YOU PASS THE LAB, AND YOU ONLY GET POINTS FOR LAB REPORTS TURNED IN.**

Some Pre-labs will be through Moodle course CHEM 117 PRE-LAB (on-line) and some will be done in your notebook (paper) introduction lecture and a Moodle quiz instead of the Pre-Lab Report described in the lab manual. You will receive more details and specific instructions in lab.

Lab Safety

Safety is a primary concern in the laboratory; we must work together to ensure a safe working environment in the lab. During the check-in laboratory, we will spend time on general lab safety, cover relevant sections from the lab manual, and point out locations of safety equipment in the lab. Abide by these guidelines and safety rules while you are in the laboratory.

Attendance at the first lab is essential. During that period we cover safety in detail, establishing how we will operate throughout the semester.

Safety must also be intentional so we will ask each of you to signify your willingness to join your instructor, assistants, and fellow students in following these rules and developing safe habits in the lab by signing this statement and abiding by that commitment.

I have read and understand the Laboratory Safety and Precautions and the Emergency Procedures sections of the lab manual. They have also been discussed in lab and/or lecture. I agree to abide by them and to work cooperatively with my instructor, assistants, and fellow students to ensure this lab is a safe place to work and learn.

Name _____

Date _____

Course Philosophies

Teaching/Learning Philosophy:

TEACHING CANNOT OCCUR UNLESS YOU, THE STUDENT, ARE ACTIVELY INVOLVED IN THE LEARNING PROCESS!! Thus learning is **not a spectator sport**, it requires an active effort on your part; reading, working problems, writing reports, etc. Learning is largely a "trial and error" process; we seldom get it right the first time, so learning also requires **PRACTICE, PATIENCE, and PERSISTENCE** (similar to participation in sports or music). The teacher **cannot make you learn**; the teacher is only a guide and a resource (a coach, if you will) to help you master the material and to sort the important from the trivial. You should not want or expect the professor to do it for you. *You should take charge of your education.*

What instructors expect of students:

- Read the chapters before they are discussed in class.
- Work problems every day.
- Come to class with questions and ask them.
- Read the lab and get organized before you come.
- Think about what you are doing in lab - don't just blindly follow the recipe.
- Spend 6-8 hours per week **outside** of class efficiently studying (4 hour class * 2, rule of thumb).

What students can expect of Instructors:

- Will *not* lecture on everything.
- Will answer questions.
- Focus in class will be on the more difficult concepts, student questions, problem solving strategies.
- Brief presentation in lab highlighting safety issues and special directions or modifications.
- Will be available outside of class.

Tips

- This is a fast paced course - **START TODAY.**
- Form a study group.
- Make connections between what you see every day and what you are doing in class.
- Do all the assigned problems - "practice makes perfect" - a few every day.
- Make use of the Chemistry tutors.
- Ask questions and persevere. The instructor wants you to succeed and will help if you just ask.

Standardized Exam Philosophy:

Why use a standardized exam?

Grades are used for a variety of purposes, most of which extend well beyond Augustana. To facilitate these ends, students' grades should give some reflection of their abilities and mastery of the subject compared to similar students across the nation. In this course the final exam in the form of a standardized exam prepared by the American Chemical Society (ACS) is used to provide that context. The rationale for using a standardized exam includes several aspects:

- Assessment tool for the Chemistry Department as it evaluates its curriculum.
- Comparison tool for you and the Chemistry Department to see how you and the class as a whole "stack up" against your counterparts across the nation.
- National norms provide a yardstick for determining a consistent grading scale.
- True mastery of a concept implies an ability to apply it in new situations. Exams prepared by someone other than the instructors provide new contexts and formats to test this ability. Or as John W. Moore wrote in an editorial in *The Journal of Chemical Education* **1998**, 75(2), 135: "*In a world in which change is the norm, only an educated student has been properly equipped to prosper. This means that students need to be able to identify and define problems, to solve them imaginatively, and to apply the chemistry they learn in a variety of contexts in other disciplines.*"
- Students gain experience/practice in taking standardized, multiple-choice exams often used as a "hurdle" for many post-college endeavors (e.g. MCAT for medical school, OAT for optometry school, DAT for dental school, GRE for graduate schools, Nursing Boards, Bar Exam, CPA certification, etc.)

Nature of Standardized Exams: General Chemistry encompasses a wide range of topics, so wide that it is impossible to cover all of them in any detail in one course. Each instructor of a General Chemistry course will select a subset of the topics that match the background and career interests of the students and the instructor's personal biases of what is most important. Comparing students in such courses on a nationwide basis with a single exam becomes a daunting task. The ACS (and many other testing agencies) approaches the task by designing an exam that covers the entire range of topics in the discipline. That means that virtually all students will encounter questions over material they *have not* seen in class, but also they will surely encounter some

questions over the material they *have* seen. The goal of the exam designers is to have an exam where the average student will get about half of the questions correct. However, the actual value of this raw score is not important. What is important is how it compares with the scores of other students taking the exam. The percentile, derived from the distribution and ranking of raw scores, provides this comparison information - it tells you specifically what percentage of students from the sampling pool scored lower than you on the exam.

Strategies for Preparation: A common myth propagated among students is that studying for standardized exams is a fruitless endeavor. **THIS IS ABSOLUTELY NOT TRUE.** If you have a firm understanding of the material covered in class, you can score quite well on these exams. So, **PREPARE** by focusing on the material we have covered in class. Also make use of the guidebook *Preparing for Your ACS Examination in General Chemistry - The Official Guide* (ACS publication). Multiple opportunities to take these exams allow you to identify and then study for problem types that are giving you difficulty.

HANDOUTS AND LINKS

Moodle Chem 117 and Class Website

- This syllabus
- Chem 117 DEW's Study Guide for McMurry and Fay, 2nd ed.
- Ions, Charges, and Naming
- Solubility Rules

Moodle Chem 117 only

- Lecture Powerpoints
- Answers to the Recommended Problems in the Study Guide
- Guide to Moodle Gradebook for Chem 117

- Honor Pledge for attaching to assignments
- Link to the class website on Moodle
- Link to Augie's Tutor homepage

Class Website only

- Past exams from Chem 120 (120 covers more topics, some in less detail)

Moodle Chem 117 Pre-Lab

- Prelab lecture videos
- Lab quizzes
- Lab handouts (if needed)

Chem 117 - Tentative Lecture Schedule (Spring 17)		
Date	Chapter	Topic
Feb 2, 5	2	Introduction, Periodicity and Electronic Structure of Atoms
7, 9	3.9-3.14	Atoms and Ionic Bonds
12, 14	5.5-5.7	Covalent Bonds and Molecular Structure (MO Theory)
16, 19	10.6-10.10	Liquids, Solids, and Phase Changes (Crystalline Structure)
Feb 21 (W)		Exam 1
23, 26	9.6-9.9	Gases: Their Properties and Behavior (Kinetic Molecular Theory)
28, Mar 2, 5	12	Rates and Mechanisms of Chemical Reactions
7, 9	13	Chemical Equilibrium: The Extent of Chemical Reactions
12-16		Spring Break
19	13 (cont)	Chemical Equilibrium: The Extent of Chemical Reactions
Mar 21 (W)		Exam 2
23, 26, 28	14.4-14.14, 18.8	Aqueous Equilibria: Acids and Bases
Mar 30-Apr 2		Easter Break
4, 6, 9	15.1-15.13	Applications of Aqueous Equilibria
11, 13, 16	16	Thermodynamics: Entropy, Free Energy, and Equilibrium
Apr 18 (W)		Exam 3
20	7.8-7.11	Reactions in Aqueous Solution (Redox Reactions)
23, 25, 27	17	Electrochemistry
30, May 2, 4	20.1-20.8, 20.10-20.12	Transition Elements and Coordination Chemistry
May 7 (M)		Exam 4
9, 11	22	Nuclear Chemistry
May 15 (M)		117A Final Exam
Chemistry in Action reports due the class day before each exam and last day of classes. No assignments accepted after 5 pm on the last day of classes. Last day to drop or change to S/U is Friday, Apr 6		

LAB SCHEDULE				
Date		Lab	Title	Chap
T (A2)	R (A1)			
Feb 6	8	14	Check In, Safety & Intro lab	
13	15	Handout (15)	Physical and Chemical Properties	1, 7
20	22	16	Properties of Some Representative Elements	1
27	Mar 1	17	Crystalline Solids	10
6	8	18	The Rate of Iodination of Acetone	12
13	15	-	Spring Break	-
20	22	19	Equilibrium Constant of $[\text{Fe}(\text{SCN})]^{2+}$	13
27	29	20	Titration of Mono- and Diprotic Acids	14, 15
Apr 3	5	21	Buffers	15
10	12	22	Solubility Product of Nickel (II) Hydroxide	15
17	21	23	The Entropy of Dissolution of Urea	16
24	26	24	Electrochemistry	17
May 1	3	25	Transition Metal Chemistry, check out	20
8	10	-	Practice ACS Exam	-
Safety and Reactions reports are due at the beginning of the lab period (5 pts). Lab Reports are due at the beginning of the following lab period (20 pts).				