

**CHEMISTRY 116 A - GENERAL CHEMISTRY 1**

FALL 2017

Lecture 8 am MWF, A1 Lab 1:30 pm T, A2 Lab 11 am T, A3 Lab 4 pm T

FSC 113B

FSC 313

FSC 313

FSC 313

**Instructor**

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 Phone (274)-4812 Home: 339-7269 class website: [faculty.augie.edu/~dew](http://faculty.augie.edu/~dew)  
 Office Hours: 9-10 am MWF and 1-2 R 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** 8:00 - 8:50 MWF FSC 113B  
**Lab A1 (DEW)** 1:30 - 3:20 T FSC 313  
**Lab A2 (Johnson-Edler)** 11:00 - 12:50 M FSC 313  
**Lab A2 (Johnson-Edler)** 4:00 - 5:50 M FSC 313

**Text & Supplies**

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

*Laboratory Experiments for General Chemistry Labs*, 2017 edition (lab manual), available from Marlys in the Physics/Natural Science Division Office (FSC 390). Cost is \$20, this year's edition is a significant revision.

Permanently bound lab notebook with duplicate pages (available in the Bookstore)

Safety Goggles with complete splash guard (available in the Bookstore)

Scientific Calculator with log and 10<sup>x</sup> (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-	630 - 580 - 550
<b>TOTAL</b>	<b>1000</b>	<b>YOU CANNOT PASS THE COURSE UNLESS YOU PASS THE LAB (151 PTS OUT OF 275)</b>	
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, Nov. 4			

**GENERAL GOALS AND EXPECTATIONS****Catalog Description**

An introduction to chemistry at the college level. The main conceptual areas of emphasis of the course are outlined in the catalog: measurements, atomic and electronic structure, bonding, molecular structure and shape, stoichiometry, types of chemical reactions, thermochemistry, gases, liquids, and solutions, and nuclear chemistry. Three hours of lecture and two hours of laboratory per week.

**Student Outcomes**

Chemistry 116 serves both as a SOPHIA: Science course and as a prerequisite to other courses.

*Science of the Natural World Augustana Educational Outcomes:*

- Analytical reasoning
- Critical and creative thinking
- Quantitative literacy

*Criteria for courses in Science of the Natural World are that the students will be able to*

- Exhibit proficiency in the application of the scientific method.
- Explain how scientific findings inform decision making.
- Apply general scientific principles to solve specific problems.
- Demonstrate comprehension and application of scientific terminology.

### General Chemistry 1 Outcomes

- Development of an understanding of some basic chemical concepts (e.g., reactions, stoichiometry, bonding and molecular structure, thermochemistry, gases, nuclear chemistry) and their impact on human lives.
- Use your understanding of concepts from this course 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, expressing results with appropriate significant figures.
- Acquire team skills through work in small groups.
- Acquire basic lab skills.

The last goal reflects that chemistry is an **experimental** science, i.e. that lab work is an integral part of the discipline. To address the various aspects of that goal, the laboratory experience in this course is designed with the following purposes in mind:

- Provide a hands-on illustration of concepts covered in lecture.
- Provide experience with the equipment and techniques used in chemistry with attention to safety issues.
- Illustrate the importance of following directions (written and oral), of organization, and of making observations in the lab.
- Develop the fundamentals of keeping a notebook 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 116A**. 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 also transitioning to using Moodle to present prelab lectures and a prelab quiz. This information will be on Moodle under **CHEM 116 Pre-Lab**. You will be given more information in lab about when and how to use this Moodle course.

### Logging in:

Go to <https://moodle.augie.edu> (from the Augie homepage, click "Current Students" and then "Moodle")

- Log in using your my.augie.edu username (for example, mjsmith07) and password.
- FA17 Chem 116A and Chem 116 Prelab should appear in your list of courses.

### Troubleshooting:

If you have any technical problems with Moodle, contact **Sharon Gray**, Augie's Instructional Technologist. Her e-mail is gray@augie.edu. Her phone numbers are: 605-624-4907 (office), 605-624-8833 (home), and 605-670-0185 (cell). (The contact information is also on the Moodle login page).

## 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](mailto: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](http://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](mailto: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](http://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>.

**Class Website** ([faculty.augie.edu/~dew](http://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 116 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.

### Computer Assisted Instruction

Three Excel spreadsheets, *Name Worksheet.xls*, *Balance Worksheet.xls*, and *Complete and Balance.xls*, are available on Moodle to give you practice in nomenclature and balancing reactions. Worksheets within each file are generated from a small database, so each printed worksheet is different. These files use macros, so you need to make sure Excel will allow macro use (the default is to BLOCK macros).

Make sure Analysis Toolpak is Active:

- Load Excel
- Click the File tab
- Click Options (left panel)
- Click Add-Ins (left panel)
- Analysis Toolpak in the *Active List*? yes- you're good to go. no - select it in the *Inactive* list and click on the GO button at the bottom of the page.
- Continue with next section or click OK until you have exited all the menus

Make sure Security is set to enable macros:

- Navigate to Excel Options (same as above, Add-Ins is on that page)
- Click Trust Center (left panel), then the Trust Center Settings button (lower right)
- Macro Settings (left panel)
- Select "Disable all macros with notification"
- Click OK until you have exited all the menus

Run the programs:

- On Moodle click the worksheet file you want to run, then choose "open with Excel." When it opens in Excel, click **enable macros**. Then click the **Print ... Worksheet** button. The screen will flash as the spreadsheet builds the worksheet and then it will print to the default printer. Each time you click the **Print ... Worksheet** button, it will print a **different** worksheet. Close Excel; don't save changes.
  - NAME - practice in naming and writing formulas.
  - BALANCE - practice in writing formulas and balancing reactions.
  - COMPLETE AND BALANCE - practice in writing formulas, predicting products of reactions, and balancing.

## 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 116 and 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), covering the entire semester, is one last opportunity for you to demonstrate that you have mastered the material presented in this class. 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.

A practice exam and its answer key assembled from retired ACS exams for Chem 120 is available on Moodle. This is not fully equivalent to the exam you will take and may contain questions on topics we did not cover, but it serves as a study aid in preparing for the final exam.

### 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/lcg/data/articlestandard/lcg/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, 6<sup>th</sup> 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 (not required for a few labs, noted in schedule on last page) 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.**

The Department is continuing to develop modules for Moodle delivery of the lab 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.

**HANDOUTS AND LINKS****Moodle and Class Website**

- This syllabus
  - Chem 116 DEW's Study Guide for McMurry and Fay, 2<sup>nd</sup> ed.
  - Ions, Charges, and Naming
  - Periodic Table
  - Link to Augie's Tutor homepage
- Class Website only**
- Link to Moodle
  - Past exams from Chem 116 & 120 (120 covers more topics, some in less detail)

**Moodle only**

- McMurry & Fay Solubility Rules
  - Lecture Powerpoints
  - Answers to the Recommended Problems in the Study Guide
  - Three Excel worksheets
  - 17f Guide to Moodle Gradebook
  - Honor Pledge for attaching to assignments
  - Link to the class website on Moodle
  - Lab Pre-lab powerpoints (not on-line)
  - 17f Lab Reports Expectations Summary
- Moodle Chem 116 Pre-Lab**
- On-line Prelab powerpoints, videos and quizzes

<b>Chem 116 - Tentative Lecture Schedule (Fall 17)</b>		
<b>Date</b>	<b>Chapter</b>	<b>Topic</b>
Aug 30, Sept 1	3.2	Introduction, Atoms and Ionic Bonds (Nomenclature)
6, 8	0	Chemical Tools: Experimentation and Measurement
11, 13	1	Structure and Stability of Atoms
15, 18	2.7-2.14	Periodicity and Electronic Structure of Atoms
20, 22	3.1-3.8	Atoms and Ionic Bonds (after nomenclature)
<b>Sept 25 (M)</b>		<b>Exam 1</b>
27, 29	4	Atoms and Covalent Bonds
Oct 2, 4	5.1-5.4	Covalent Bonds and Molecular Structure
6, 9, 11	6	Chemical Arithmetic: Stoichiometry
<b>Oct 13 (F)</b>		<b>Exam 2</b>
16, 18, 25	7.1-7.7	Reactions in Aqueous Solution
<b>20, 24, 25</b>	-	<b>No class – MWRM &amp; Fall Break</b>
27, 30, Nov 1	8	Thermochemistry: Chemical Energy
3, 6	9.1-9.5	Gases: Their Properties and Behavior
8	10.1-10.5, 10.11	Liquids, Solids, and Phase Changes
<b>Nov 10 (F)</b>		<b>Exam 3</b>
13, 15	11	Solutions and Their Properties
17, 20	13.1, 13.2, 13.7-13.11	Chemical Equilibrium: The Extent of Chemical Reactions
<b>23-24</b>	-	<b>No class – Thanksgiving Break</b>
27	14.1-14.6	Aqueous Equilibria: Acids and Bases
29, Dec 1	22.3-22.6	Nuclear Chemistry (also handout)
<b>Dec 4 (M)</b>		<b>Exam 4</b>
6		wrap up and review
<b>Dec 13 (W)</b>		<b>116A Final Exam (9 am)</b>
<b>Chemistry in Action reports due the class day before each exam and last day of classes.</b> No assignments accepted after 5 pm on the last day of classes. Last day to drop or change to S/U is Friday, Nov 3.		

<b>LAB SCHEDULE</b>				
<b>Date (lead lab bold)</b>		<b>Lab</b>	<b>Title</b>	<b>Chap</b>
T	R			
Sept 5	7	1*	Check In, Safety & Intro lab	0
12	14	3	Scientific Measurements	0
19	21	5*	Library Exercise	-
26	28	4	Determination of Isotopic Abundance and Avg Atomic Mass	1
Oct 3	5	6*	Molecular Models	4, 5
10	12	7 long method	Inorganic Synthesis	5, 6
17	26	8	Determination of Organic Acid Content of Vinegar	6, 7
<b>24</b>	<b>19</b>	<b>no lab</b>	<b>Fall Break and Midwest Regional ACS Meeting</b>	
31	Nov 2	9	Calorimetry	8
7	9	10	Gas Laws	9
14	16	11	Freezing Point Depression	11
<b>21</b>	<b>23</b>	<b>no lab</b>	<b>Thanksgiving Break</b>	
28	30	12	LeChatelier's Principle	13
5	7	13	Acids, Bases, and Buffers; Check Out	14
*no Safety and Reactions report for these labs <b>Safety and Reactions reports are due at the beginning of the lab period (5 pts).</b> <b>Lab Reports are due at the beginning of the following lab period (20 pts).</b>				