

## **CHEMISTRY 108** **SPRING 2017**

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<b>Office Hours:</b>	M/W/F 10:00 am–11:00 am T 10:00 am–12:00 pm and By Appt
<b>Lectures:</b>	M/W/F 12:05-12:55 pm, Room 1361
<b>Labs:</b>	Room 1329
<b>Discussion:</b>	As Assigned
<b>Course Website on Learn@UW:</b>	<a href="https://learnuw.wisc.edu/">https://learnuw.wisc.edu/</a>
<b>General Chemistry Homepage:</b>	<a href="http://genchem.chem.wisc.edu/">http://genchem.chem.wisc.edu/</a>
<b>General Chemistry Office:</b>	Room 1328 Chemistry 263-2424
<b>Important Dates:</b>	Deadline for 100% Refund: <b>1/27/2017</b> Final Drop Date: <b>3/17/2017</b>

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### **INTRODUCTION**

Chemistry 108 is a one-semester introductory course that includes selected topics in inorganic and organic chemistry. Emphasis is on relevance to biological, environmental and societal issues. Chemistry 108 is not intended for students who expect to take additional chemistry courses and it does not satisfy any prerequisites for further chemistry courses.

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### **COURSE PHILOSOPHY**

Unlike more traditional chemistry courses where the chemistry content is the central theme, in CHEM 108 the chemistry concepts will be introduced on a need-to-know basis as various contemporary topics and themes are explored. As well as gaining understanding about basic chemistry principles, students are also expected to apply their chemical knowledge to understand complex issues.

Upon completion of this course you will have acquired a foundation of knowledge in basic chemistry principles. Although there are plenty of resources to help you achieve this goal your grade will be determined by your ability to demonstrate your comprehension and knowledge by completing quality lab reports, assignments, and performance in tests and quizzes. Your grade is not determined by my perception or your perception of the time and effort you put into the class. Investing the necessary time and effort is an expectation.

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## REQUIRED MATERIALS

### 1. Textbook

Title: Chemistry in Context: Applying Chemistry to Society, 8<sup>th</sup> Edition, 2015.

Authors: Middlecamp, Mury, Anderson, Bentley, Cann, Ellis, Purvis-Roberts

Publisher: American Chemical Society and McGraw Hill

**ISBN 978-0-07-352297-5**

2. Chemistry 108 Laboratory Manual. The manual can be purchased from CHEM 1375 during the first weeks of class using your WiscCard

3. Indirectly vented industrial quality eye protection is required in all chemistry laboratories. These, and ones that fit over regular glasses, can be purchased from the University Bookstore.

4. The whole-class sessions will make extensive use of student "voting" concept tests, surveys, and other questions. We will be using the Top Hat ([www.tophat.com](http://www.tophat.com)) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones or tablets (via the Top Hat app), laptops (via their website), or through text message (tutorial link here). Top Hat is the supported student response tool at UW-Madison, and you may be using Top Hat in multiple classes throughout the academic year.

You can visit the Top Hat Overview, which outlines how you will register for a Top Hat account and provides a brief overview to get you up and running on the system. You can register via the Top Hat website. This registration will cost \$16 for one semester, \$20 for one year or \$54 for life. Follow these directions to set up your account. **The specific course code for CHEM 108 is 861048.**

Should you require assistance with Top Hat at any time, please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in app support button, or by calling 1-888 - 663-5491.

5. An electronic calculator – either an inexpensive scientific or graphing calculator. Cell phone calculators are not allowed to be used in the laboratory or on tests.

6. Note packet (free!) available through the D2L course website.

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## **COURSE INFORMATION**

### **Course Organization**

There are four components of CHEM 108; Pre Class Activity, Lecture, Discussion and Lab.

#### **Pre Class Activity**

Pre class activities are designed to prepare you for the lecture and discussion classes by providing access to content recordings and assigned readings which will be further developed in class. The relevant activity will be communicated through the course D2L Homepage.

#### **Lecture**

There are three lectures per week each 50 mins in length. During lectures you will be introduced to concepts, work through numerical problems, watch demonstrations, and answer questions using the Top Hat application (counts towards final grade). To facilitate effective note taking a note packet will be available through the course website for each unit of study which you will bring to the class. At the end of each unit you will have a completed note packet which will help you review for midterm exams. At the end of the course you will have a complete set of notes which will prove extremely useful for the final examination. Augmenting your notes using the textbook as a resource will also be an effective part of your learning strategy. Some content will be available before lecture in short videos which will also enable you to complete the note packet.

With large classes respectful classroom etiquette is expected. Cell phones should be silenced. While laptops are not prohibited in class, you will not have any need for them during lecture except to take notes. Using the computer or other devices during class for activities not related to the class is very distracting, not only for you but for those who are sitting nearby. Finally, the lecture room desks are very noisy when raised or lowered; so please wait until the instructor is completely done speaking before you lower your desk at the end of class. As much as possible class will be dismissed at 12:55 PM, but sometimes just another minute or two is needed to finish up. Please be considerate of your classmates.

We will use demonstrations during lecture to illustrate important ideas and facts. Be sure to make careful observations of what happens. Questions about observations or principles that have been presented via demonstrations may appear on exams.

#### **Discussion Section**

Two times each week, you will meet with a teaching assistant (TA) and your classmates for discussion. In these meetings, you will discuss problems, work with groups of students to learn new material or reinforce/review existing ideas, learn about upcoming laboratory assignments, have a forum for answering questions, and take quizzes.

## Laboratory

**To pass this class you cannot miss more than two laboratory exercises.**

The laboratory experiments are a vital part of this course; you will develop skills that are not easily learned or demonstrated in lectures. These skills include:

- Designing experiments and interpreting data
- Using laboratory equipment properly
- Working with your fellow students in the laboratory
- Communicating your ideas about the data through discussions and writing

Your laboratory report is almost always due at the end of the laboratory period. Late laboratory reports are not graded. The lab schedule is printed on the attached calendar.

Please note that sandals are not acceptable footwear in the laboratory. Contact lenses should **not** be worn in the laboratory because fumes or splashes may be caught between them and your eye. Further attire requirements are described in your laboratory manual and by your TA.

There is no opportunity to make up a laboratory that you miss; a grade of zero will be recorded for unexcused absences. If you have an excuse for missing lab, notify your TA as soon as possible, preferably before the lab period. The lowest lab grade of the semester will be dropped.

**Health or Disability Concerns.** If you have special needs, please make an appointment to speak to your lecturer and TA at your earliest convenience.

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## **PROBLEM SETS AND HOMEWORK**

Problem solving is a crucial aspect of this course and suggested study problems will be assigned on a regular basis. Supplementary problems will also be worked on in Discussion sections. Your textbook is an excellent source of additional practice problems, and answers to selected problems are given at the back of the book.

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## **EXAMS AND QUIZZES**

**Quizzes.** Quizzes will be given during discussion sections to help you evaluate your progress and to encourage you to memorize essential information.

**Exams.** There will be four in-class exams of 50 minutes each and one two-hour comprehensive final exam. **Makeup exams will be only be arranged under extenuating circumstances given and prior permission, where possible, obtained.** Exams may include questions based on the laboratory material. **Please be alert to these exam dates.** You must report any religious conflicts with exams or laboratory exercises to your teaching assistant within the first two weeks of classes.

Exam Dates:	<b>Wednesday, February 8</b>	12:05 – 12:55 PM
	<b>Monday, March 6</b>	12:05 – 12:55 PM
	<b>Monday, April 10</b>	12:05 – 12:55 PM
	<b>Monday, May 1</b>	12:05 – 12:55 PM

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## GRADES

### Grade Distribution

Below is the letter grade distribution for this class

A	93.0%
AB	88.0%
B	83.0%
BC	78.0%
C	70.0%
D	60.0%
F	<60.0%

This distribution will never be distributed up, i.e., a student achieving 93.0% or greater will receive an A grade, however, it may be distributed down (curved) depending on the final class grade distribution.

### Grading Criteria

Four 50-minute exams	10% each
Assignments	15%
Laboratory	20%
Quizzes and Clickers	10%
Final Exam	15%
<b>Total</b>	<b>100%</b>

Your scores will be available through Learn@UW

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## **ADDITIONAL RESOURCES**

Numerous resources are available to assist you with either this course in particular or college life in general. It is up to you to take advantage of these resources to ensure your success both in this course and at UW-Madison.

**Course Web-site on Learn@UW** (<https://learnuw.wisc.edu/>): Our course website can be accessed via Learn@UW. The syllabus, schedules, office hours, TA lecture notes, course handouts, announcements and grades will all be available on Learn@UW.

**Study Groups:** You may collaborate with other students on homework assignments and laboratory discussion questions. Study groups reflect the teamwork inherent in the way modern science is done; scientists frequently collaborate with others, either within the same department or at a distance with persons in other cities, states or countries. It is important to realize that although you may collaborate with other students on assignments, the work you submit must be your own.

**Tutoring Services:** A number of tutoring resources are available on campus, some free and some for a fee. For more information, see our Learn@UW site or the General Chemistry home page (<http://genchem.chem.wisc.edu/>) under the "More for Students" section.

**Students with Disabilities:** Appropriate accommodations for lecture, laboratory, discussion, and/or exams can be arranged for students with disabilities. The McBurney Disability Resource Center (<http://www.mcburney.wisc.edu/>) can provide assistance. Accommodations still must be made well in advance, so please pursue these avenues immediately.

**Advising and Counseling Services** (University Health Services): College life can be stressful. If you are struggling with your academic course load or other academic issues, your advisor is a good resource. If you are struggling emotionally with anxiety, depression, or other health issues, individual counseling is available at University Counseling and Consultation Services. For more information go their website ([http://www.uhs.wisc.edu/home.jsp?cat\\_id=36](http://www.uhs.wisc.edu/home.jsp?cat_id=36)) or call 265-5600. Crisis intervention services are also available 24 hours a day by dialing this same phone number and pressing option 9.

**Academic Misconduct:** It is expected that all students will conduct themselves with honesty, integrity, and professionalism. Any student caught cheating on an exam will receive an F in the course. Any student caught cheating on homework, a quiz, or lab (for instance, copying another person's work or fabricating data) will receive a zero for that assignment. A second infraction will result in an F for the course. More information on what constitutes academic misconduct and policies on handling misconduct can be found in your chemistry lab manual and at the following website: <http://www.wisc.edu/students/saja/misconduct/UWS14.html>

## COURSE OUTLINE AND CALENDAR

Dates for lecture topics are **approximate**. The exam dates are **fixed**. The course website on Learn@UW will have details of the specific recordings to watch and assignment due dates.

<b>Week</b>	<b>Class</b>		<b>Lab</b>
1	Class 1 1/18 Class 2 1/20	Introduction Unit 1	Lab 0: Lab Check In (No Monday Lab)
2	Class 3 1/23 Class 4 1/25 Class 5 1/27	Unit 1 Unit 1 Units 1 and 2	Lab 1: Physical and Chemical Changes
3	Class 6 1/30 Class 7 2/1 Class 8 2/3	Unit 2 Unit 2 Unit 2	Lab 2: Preparation and Properties of Gases in Air
4	Class 9 2/6 <b>EXAM 1 2/8</b> Class 10 2/10	Unit 3  Unit 3	Lab 3: Refrigerant Gases
5	Class 11 2/13 Class 12 2/15 Class 13 2/17	Unit 3 Unit3/Unit 4 Unit 4	No Laboratory Scheduled
6	Class 14 2/20 Class 15 2/22 Class 16 2/24	Unit 4 Unit 4 Unit 4	Lab 4: Energy Content and Fuels Part I
7	Class 17 2/27 Class 18 3/1 Class 19 3/3	Unit 5 Unit 5 Unit 5	Lab 5: Energy Content and Fuels Part II
8	<b>EXAM 2 3/6</b> Class 20 3/8 Class 21 3/10	 Unit 5 Unit 5	Lab 6: Light in Our Atmosphere

<b>Week</b>	<b>Class</b>		<b>Lab</b>
9	Class 22 3/13 Class 23 3/15 Class 24 3/17	Unit 6 Unit 6 Unit 6	Lab 7: Polonium-210 Contamination in Cigarettes Part I
10	Class 25 3/27 Class 26 3/29 Class 27 3/31	Unit 6 Unit 7 Unit 7	Lab 8: Molecular Models
11	Class 28 4/3 Class 29 4/5 Class 30 4/7	Unit 7 Unit 7 Unit 7	Lab 9: Chemical Moles: Converting Baking Soda to Table Salt
12	<b>EXAM 3</b> 4/10 Class 31 4/12 Class 32 4/14	Unit 8 Unit 8 Unit 8	Lab 10: pH of Rain and Other Common Substances
13	Class 33 4/17 Class 34 4/19 Class 35 4/21	Unit 9 Unit 9 Unit 9	Lab 11: Biodiesel Synthesis
14	Class 36 4/24 Class 37 4/26 Class 38 4/28	Unit 9 Unit 10 Unit 10	Lab 12: Polonium-210 Contamination in Cigarettes Part II  Lab Check Out
15	<b>EXAM 4</b> 5/1 Class 39 5/3	 Unit 10	No Laboratory Scheduled
16	<b>FINAL</b> 5/9	<b>7:25 pm – 9:25 pm</b>	

## COURSE TOPICS

<b>Unit</b>	<b>Chapter</b>	<b>Chemistry Concepts</b>
Unit 1: Atoms, Ions, and Isotopes	Various	Atomic Structure of the Nucleus Dalton's Atomic Theory Ionic Compounds Metric Conversions Physical and Chemical Changes
Unit 2: The Air we Breathe	1	Classification of Matter Elements, Atoms, and Molecules Naming Molecular Compounds Alkanes Writing Balanced Chemical Equations
Unit 3: The Ozone Layer	2	Lewis Structures of Molecules Electromagnetic Radiation
Unit 4: Energy from Combustion	4	Moles Thermochemistry
Unit 5: Greenhouse Gases and Global Warming	3	Infrared Spectroscopy Moles
Unit 6: Nuclear Chemistry and Radioactivity	5	Nuclear Chemistry
Unit 7: Water and Solutions	6	Molecular Geometry Water H-Bonding,
Unit 8: Acid Rain and Ocean Acidification	7	Aqueous Solutions (Electrolytes) Acid/Base
Unit 9: Plastics and Polymers	9	Organic Compounds Polymers
Unit 10: Nutrition and Food	11	Biochemistry