

**CHEMISTRY 13600 FALL 2023**  
**(4.00 CREDITS)**  
**COURSE PACKET**

**Professor:** Adam Wasserman, WTHR-221B, phone: 494-4234, [awasser@purdue.edu](mailto:awasser@purdue.edu)

**Teaching Assistants:** Satarupa Gupta, [gupta872@purdue.edu](mailto:gupta872@purdue.edu)  
Isaac Ofori, [iofori@purdue.edu](mailto:iofori@purdue.edu)

**Class Schedule:**

- **Lectures:** Monday and Wednesday: 8:30 - 9:20 AM, **WTHR-362** (CRN: 23989)  
Friday: 8:30 - 9:20 AM, **WALC-3084**
- **Labs:** Tuesday: 11:30 AM - 2:20 PM, **CHAS-B025** (CRN: 23991)  
Tuesday: 3:00 PM – 5:50 PM, **CHAS-B025** (CRN: 23992)
- **Voluntary Help Session (PSO):** Thursday: 11:30 - 12:20 PM, **BRWN-3100** (CRN: 23996)  
Thursday: 3:30 – 4:20 PM, **BRWN-3104** (CRN: 24000)
- **Office hours:** Satarupa Gupta: Mondays 2:00 – 3:00 PM through Microsoft Teams  
Isaac Ofori: Mondays 7:00 – 8:00 PM through Microsoft Teams  
Prof. Wasserman: Fridays 1:30 – 2:30 PM in **WTHR-221B**

**Main learning objective:**

*Understand key principles of nature that determine the properties of matter.*

**Learning outcomes:**

By the end of the course, you will be able to:

1. Describe the most important properties of atoms and molecules; explain how energy quantization leads to periodicity of atomic properties and to different types of chemical bonds.
2. Explain how large collections of atoms or molecules develop the observed macroscopic properties of gases, liquids, and solids.
3. Outline the basic principles of thermodynamics and explain why and how they are central to life.

**Brief course description:**

CHM-13600 is a 4-credit General Chemistry course offered to College of Science students to provide them with an opportunity to study topics of *both* CHM-11500 and CHM-11600 (or, equivalently, CHM-12500 and CHM-12600) in one semester. The course covers atomic and molecular structure, periodicity, an introduction to chemical reactions, properties of gases, liquids, and solids (typically discussed in CHM-11500), as well as chemical kinetics, chemical equilibrium, and thermodynamics (typically covered in CHM-11600). CHM-13600 is recommended for students who:

- (1) Have credit for Calculus 1 (MA 16500 or 16100)
- (2) Would like to take a sophomore-level class in the spring semester of their freshman year. (Note: Credit earned for CHM-13600 counts as CHM-12600 or CHM-11600 credit).
- (3) Would like to receive Honors credit for a first-semester chemistry course.

The class includes a lab component, weekly lectures, weekly interactive discussion sessions, and a final project on the connection between chemistry and other fields.

## Course Materials:

- Textbook: *General Chemistry, 4th Ed.*, by D.A. McQuarrie, P.A. Rock, and E.B. Gallogly. ISBN: 978-1-891389-60-3.
- *Digital Materials*: Students enrolled in this course must purchase digital materials for lab and pay a Digital Materials Charge (\$35). The link to purchase access is here: <http://www.eventreg.purdue.edu/online/CHM2023Fall35>. Payment is **due by Friday, September 1, 2023**.
- Microsoft Teams and OneNote as provided by Purdue (use your Purdue e-mail to register).
- *Required Safety Equipment*: Approved chemical-splash safety goggles (you will need to bring these to the check-in lab on August 29).

***Course materials including lecture notes, homework and problem sets discussed in class may not be distributed or posted on-line.***

## Course Policies:

### ***Attendance***

It is expected that you attend all lectures. We don't take attendance in lectures but you will be responsible for any announcements or course changes that are made in lecture and you will be responsible, of course, for the content discussed in lecture. Quizzes will be given during the first 10 minutes of lecture on most Fridays (please refer to the syllabus). No make-up quizzes will be given.

Chemistry 13600 is a **laboratory** course and attendance in the laboratory is mandatory. It is not possible to make-up a missed lab. *Students who fail to complete, or miss **more than two lab experiments** will automatically earn a grade of "F". Completion of an experiment includes completion and timely submission of a satisfactory laboratory report.*

### ***Laboratory Reports***

Each student must turn in a short pre-lab at the beginning of every lab. Also, each student must turn in a lab report that will be due prior to the beginning of the lab one week from the day you did the experiment.

Guidelines for writing the pre-labs and lab reports will be discussed during check-in lab on August 29.

### ***Late Laboratory Reports***

For any lab report late no more than one week, 50% of the maximum points will be deducted from the score. Any late lab reports should be e-mailed to Satarupa Gupta and Isaac Ofori. If the lab report is more than a week late, it will receive a grade of zero.

### ***Safety Certification***

You must complete the online safety certification found on Brightspace with a score of 100% by **11:59 PM on Sunday, September 3**. You must confirm your score in the Brightspace grade center by clicking the My Grades link. You will be sent home and will receive a zero for *each lab* you miss due to an incomplete safety certification.

## **Laboratory Notebook**

You are responsible for maintaining a virtual laboratory notebook each time you are in the laboratory. Your graduate instructor will check this before you begin the experiment. Guidelines for the Laboratory Notebook, which will be run through OneNote and Teams, will be discussed during Lab check-in on August 29.

## **Homework and Reading**

Homework gives you first-hand experience in solving problems to master the contents of this course. A list of assigned reading and homework problems from the textbook will be posted on Teams every Monday and will be due the same week on Friday at 8:30 AM. One of the two quiz questions each Friday will be taken directly from the homework (but homework itself will not be graded).

## **Quizzes**

As many as thirteen 10-minute quizzes will be given (see schedule). Each quiz will consist of two questions: one question taken directly from the homework due that day and one question from the class notes for the week.

## **Final Presentation**

Guidelines for the final presentation will be posted on OneNote and explained in Week 5. Topics will be assigned on Friday, Sept.22. The written assignment should be turned in on Friday, Dec.1 through Microsoft Teams.

## **Exams**

There will be two exams given in the evening during the course of the semester and a final exam given during Final Exam week. The date and time and location of each exam is given below.

Exam I	150 points	Thursday, <b>September 21, 8:00-9:30 PM, FRNY B124</b>
Exam II	150 points	Thursday, <b>October 26, 8:00-9:30 PM, FRNY B124</b>
Final Exam	300 points	TBA**

*\*\*Wait until you know the date of the final exam before you make travel plans that might conflict with the exam. Early exams **will not be given** to accommodate your travel plans.*

**No make-up quizzes, or exams will be given.** We will not be evaluating reasons for exam absences and, therefore not prorating any exam scores (note that the lowest exam score will be dropped at the end of the semester but, if you miss two exams, the second missed exam will count as a zero toward your final exam grade).

### During exams:

- Cell phones, i-pods, PDAs, laptops, etc. may not be used during exams.
- Simple scientific calculators are the only electronic tools that can be used during exams.
- Programmable, graphing, alpha-numeric calculators **may not** be used during exams.
- You may not share a calculator with another student.

- If you arrive late for an exam (within the first 15-minute window) you will not receive additional time to complete the exam and scan sheet .

**Accessibility and Accommodations:**

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center, Young Hall, Room 830, 302 Wood Street, at: [drc@purdue.edu](mailto:drc@purdue.edu) or by phone: 765-494-1247.

If you require accommodations to access course activities or materials, the accommodations must be described and approved by the Disability Resource Center, Young Hall Room 830, 302 Wood Street, 765-494-1247, [www.purdue.edu/drc](http://www.purdue.edu/drc). To implement accommodations, you must follow the instructions provided by the Disability Resource Center, *in addition to* sharing your “Notification of Course Accommodations” with the CHM 13600 instructors via the AIM system *at least one week before* an exam or assessment for which accommodations are desired. Once we receive notification, we will discuss your individual case and your options within this course with you. *Implementation of accommodations may not be possible if insufficient notification is given.*

**Grief Absence Policy for Students (GAPS)**

A student should contact the Office of the Dean of Students (ODOS) to request that a notice of his or her leave be sent to instructors. The student will provide documentation of the death or funeral service attended to the ODOS. Given proper documentation, the instructor will excuse the student from class and provide the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for missed assignments or assessments.

**Military Absence Policy for Students (MAPS)**

A student should contact the Office of the Dean of Students (ODOS) to request that a notice of the leave be sent to instructors as soon as the student is informed of the dates of mandatory military training. Given proper documentation, the instructor will excuse the student from class and provide the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for missed assignments or assessments.

**Total Points**

Exams (2 @ 150 points each) .....	300
Final exam (300 points) .....	300
<b>Total from exams</b> (drop lowest midterm or half of the final) .....	<b>450</b>
<b>Quizzes (13 @ 15 points each; drop 3 lowest)</b> .....	<b>150</b>
<b>Laboratory (11 reports @ 25 points each; drop lowest)</b> .....	<b>250</b>
<b>Final presentation</b> .....	<b>150</b>
<b>Total</b> .....	<b>1000</b>

**Grades:**

- A: **850**, and completed a minimum of 9 labs.
- B: **750**, and completed a minimum of 9 labs.
- C: **650**, and completed a minimum of 9 labs.
- D: **550**, and completed a minimum of 9 labs.

F: < 550 OR did not meet the requirement of completing a minimum of 9 labs.

No make-up work will be available for missed exams, quizzes, or labs.

### ***Saving Graded Materials***

Save all of your quizzes, exams, laboratory reports and your laboratory notebook until your final grade for the course is given.

### ***Calculators***

The teaching staff of CHM 13600 may tell you to erase the memory register of any alphanumeric calculator before or during exams and quizzes.

### ***Purdue Honors Pledge***

“As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.” <https://www.purdue.edu/provost/teachinglearning/honor-pledge.html>

### ***Academic Integrity***

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing [integrity@purdue.edu](mailto:integrity@purdue.edu) or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

Cheating (including plagiarism) will be punished as severely as allowed under University guidelines. See the Office of the Dean of Students publication, Academic Integrity: A Guide for Students, which is available at <https://www.purdue.edu/odos/academic-integrity> and is an excellent summary of expectations for Purdue students.

- Having been found guilty of cheating can be as bad as having had a felony conviction when employers look over your college record. It is a serious offense, and students have been expelled from the University (and subsequently denied admission to another University) for cheating on exams, quizzes, or lab reports.
- Students caught copying a lab experiment, altering data on a lab experiment, turning in photocopies of laboratory data (i.e., graphs, data tables, calculations, etc.) or turning in a lab report or other work which they didn't do will face consequences ranging from a zero on the report to a zero in the lab for the entire semester. All incidents of academic integrity are referred to the Office of the Dean of Students. A student accused of academic dishonesty will be afforded due process as defined by Purdue University procedures.
- Students caught copying or with a written or electronic crib in their possession during an exam or quiz will fail the course. The Dean of Students Office will be informed of this action, which may result in their being expelled from Purdue.

*Examples of academic dishonesty (Cheating):* While the following list of examples of academic dishonesty is not complete, the examples are provided for your information. If you have any questions at all about permissible behavior, save yourself some grief and ask before acting.

- Plagiarism in any form. Using the exact language of someone else without the use of quotation marks and without giving proper credit to the author is plagiarism.

- Copying or possessing an unauthorized crib (written or electronic) during an exam.
- Copying from another student's exam. Allowing another student to copy from your exam.
- Copying a lab report; giving your lab report to someone else to copy. This includes files on computer disks and websites as well as paper copies.
- Changing data for a lab project to fit the perceived answer (that is, what you think the answer should be).
- Using someone else's data as if the data were your own.
- Submitting a lab report or other work that you did not do.

**Rudeness** (*n.* The state or quality of being impudent. Synonyms: cheek, gall, audacity, boldness, insolence, impertinence, impudence, brazenness, disrespect, forwardness, sauciness)

The Oxford English dictionary defines *rude* as 1. Uneducated, unlearned; ignorant; characterized by ignorance or lack of learning. 2. Uncultured, unrefined, unsophisticated, ... also, uncivilized, primitive. 3. Inexperienced; inexpert, unskilled. 4. Ill-mannered, impolite; offensive or discourteous, esp. intentionally.

Rudeness won't be tolerated in this course. The professor in charge reserves the right to lower the letter grades of students exhibiting this behavior by as much, but not more than, one letter grade.

### ***A Few Words About Your Graduate Instructor***

Your graduate instructor is the person who has the closest contact with you in this course. The graduate instructors in the Department of Chemistry aren't just "a bunch of grad students." They are graduate students, all of whom have been through a training program in teaching and tutoring skills and some of whom have several years of experience in teaching. If you are having a problem with some aspects of the course, go first to your graduate instructor. He/she wants to get to know you and help you and is available for consultation both at specific hours and by appointment. However, he/she isn't going to "spoon-feed" chemistry to you. Your success in this course depends on the amount of work you put into it.

## **LABORATORY POLICIES**

Students' safety in the laboratory is a priority and everyone is required to comply with the following safety regulations. Failure to comply will result in being sent home from lab **with a score of zero**, which counts as a lab absence.

- Dress appropriately (see below).
- Splash-proof goggles are required **at all times in the laboratory**, including during report-writing and lab check-out. If you are in lab and your goggles are not covering your eyes, you will be sent home and will receive a zero for the lab and the lab report (failure to complete).
- Wear gloves when specified.
- Remove your gloves if/when you leave the lab room for any reason and throw them away.
- If your hair is longer than shoulder length, you must tie it behind your head.
- Contact lens wearers are encouraged to wear glasses in the laboratory.
- Food and beverages are prohibited in the labs. (No water bottles in lab!)
- Follow your instructor's guidance on appropriate handling of hazardous materials and disposal of chemical waste.

- Promptly clean up spills and tidy the laboratory before leaving.

### Appropriate Dress

Everyone working in a teaching lab must be appropriately clothed at all times, including check-out.

Proper dress (clothing and shoes) is required. Your clothing must **cover you from your neck (collarbone) to your ankles** when sitting, standing or reaching. Your feet must be completely covered by your shoes.

If you attend lab in unacceptable attire, you will be sent home and will receive a zero for the lab (failure to complete).

**Unacceptable** clothing includes, *but is not limited to*:

- tops that are sleeveless, low-cut or V-neck (below the collar bone), bare midriff or tank-style
- see-through, transparent or sheer clothing
- pants that are ripped or have **holes** in the fabric of *any* size
- tights or thin (translucent or transparent) **leggings**
- Capri or cropped pants
- Skinny or ankle pants that reveal skin between the shoe and the bottom of the pant leg
- shorts
- short skirts
- open-toed and/or open-heeled shoes (including Crocs, Birkenstocks or other clogs)
- sandals (with *or* without socks)
- **boat shoes**, ballet flats, slippers, moccasins, or any shoe that doesn't cover the **entire** top of your foot and ankle, with **or** without socks

► If you come to lab wearing anything in the list above, you will be sent home and you will get a zero for that lab and it will count as a missed lab.

### Laboratory Equipment Policies

You will be sharing an assigned laboratory drawer of equipment with the students at your lab bench. You and your lab partners will have the opportunity to assess the equipment during check-in day. Check-in is your chance to replace, at no charge, equipment that is un-useable i.e. dirty, chipped, cracked, stained, broken, etc. It is important that you inspect all pieces of equipment carefully.

After check-in day:

- It is important that you do your part to maintain the drawer throughout the semester by cleaning all the glassware after use by washing with hot water, soap, and a brush, rinse with



tap water, then rinse with deionized water (it's a 3-step process to clean the glassware and you will have better experimental results with clean glassware).

- If you are responsible for a piece of equipment becoming un-useable i.e. the piece becomes chipped, cracked, stained, broken, etc., you must go to the storeroom (immediately) and purchase a replacement.
- Should you discover that a piece of equipment is missing, first check with the other students at your table and the lost and found box. If the piece is still missing, your group must replace it immediately. The storeroom staff can split the cost of a replacement among all or any number of lab partners.
- Oftentimes pieces of equipment are broken accidentally; for instance, a thermometer rolls off the bench and breaks. Replacing the thermometer is still the responsibility of the group and the storeroom staff can split the cost of a replacement among the lab partners.
- Your TA will open the drawer before lab each week. You may store personal items in the drawer, such as goggles, but you should label everything with your name.
- **Leaving the Course:** If you change sections, drop the course, or withdraw from the university, it is your responsibility to check out of your assigned drawer during your scheduled lab period. **Failure to check out of lab will result in a \$45 fee**, and forfeiture of the right to determine the acceptability of all drawer equipment. In other words, you will be charged for all equipment that is unacceptable (dirty, broken, chipped, missing, etc.).

#### Check-out day:

- On the last of laboratory, you and your lab partners will check-out of your lab drawer. You must arrive on time, properly dressed and wear goggles. If you arrive more than 15 minutes late, you will be asked to leave the lab and assessed a fee of \$45.
- You and your lab partners will clean and inventory the drawer for your TA's inspection. All missing or un-useable equipment must be replaced at that time.

#### **Important Information about Checking Out of Your Laboratory Drawer, Changing Lab Sections, Dropping a Lab Course or Withdrawing from the University:**

- **You must check-out of your laboratory drawer by the last laboratory scheduled or you will be assessed a \$45 fee plus any equipment costs.**
- **You must checkout of your drawer during your schedule lab time. Contact the course supervisor if need to make alternate arrangements to checkout.**
- Inform the storeroom staff immediately if you are changing lab sections, dropping a lab course or withdrawing from the University. Check-out involves a process where you and your TA or other staff member inspect the items in your drawer before you are released from responsibility for the items in the drawer.
- If you **change sections**, you are still required to properly checkout of your current locker drawer before checking into another section.
- If you **drop or withdrawal** from this lab course before the end of the semester, you are still required to properly check-out of your locker drawer.
- If you have any questions about properly checking out of your locker drawer, go to the storeroom, STEM 1041 or 4039, for assistance!
- Again, **failure to properly check-out** of your lab drawer will result in a **failure to checkout fee (\$ 45) assessed against you. In addition, you will be charged for missing and/or unacceptable equipment.**



## SOURCES OF HELP FOR CHEMISTRY 13600

### **Resource Room**

Between 600 and 800 general chemistry students use the Resource Room in **WTHR-117** each day. This suggests that the Resource Room has something to offer! For example, copies of exam cribs as well as exams from previous years of other courses are available in the Resource Room. A complete description of the resources that are available in the Resource Room are listed below:

- Free help and tutoring from the staff assigned to this area
- A variety of course materials (cribs of hour exams and lab manuals)
- A small library of general chemistry texts and programmed learning materials
- Current issues of *Chemical and Engineering News*
- Electronic calculators for doing chemistry problems
- Molecular and crystal models
- Computers

A student ID card is required to check out most of the materials. Open hours for the Resource Room are MTWR 8:30-8:30, F 8:30-5:30, Sat 10-6. Sun 12-4.

### **Wetherill Instructional Computing Laboratory**

The chemistry department has a microcomputer laboratory located in WTHR 113/114 and WTHR 214. The laboratory contains IBM-compatible computers connected to ITaP and two local high-speed laser printers. The computing laboratory will have open hours for student work. Announcements will be made in lecture and by your TA's regarding the use of this computing laboratory.

### **Mental Health:**

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack, <https://purdue.welltrack.com/>. Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please see the Office of the Dean of Students, <http://www.purdue.edu/odos>, for drop-in hours (M-F, 8 am – 5 pm).

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends

and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

*Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. Purdue's nondiscrimination policy can be found at [http://www.purdue.edu/purdue/ea\\_eou\\_statement.html](http://www.purdue.edu/purdue/ea_eou_statement.html).*

### **Emergencies:**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to CHM 13600 will be posted on the course Blackboard site or can be obtained by contacting the instructors or TAs via email or the General Chemistry office via phone at 765-494-5250. **You are expected to read your @purdue.edu email on a frequent basis.**

**"Shelter in Place"** means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, earthquake, release of hazardous materials in the outside air, active shooter, building intruder, or a civil disturbance. If you hear the **All Hazards Outdoors Emergency Warning Sirens** or are notified via text or other means, immediately go inside a building to a safe location and use all communication means available to find out more details about the emergency. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave. There is no "all safe siren;" the notification will come via text, internet, or email announcement.

In the case of a major campus emergency involving a shelter-in-place, **all** laboratory experiments will be halted while students shelter in lab. Students' lab grades will **not** be penalized in this situation.

## Lecture/Lab Syllabus<sup>1</sup>

Week	Dates	Week at a glance	Topic	Chapters
1	08/21 – 08/25	M: Course intro. <a href="#">Why Chemistry?</a> T: No lab, but need to complete “Safety training” on Brightspace W: Baseline assessment. F: <a href="#">Length-scales and time-scales</a>	Intro to Chemistry	<b>1 - 3</b>
2	08/28 – 09/01	M: <a href="#">Ionization energies of atoms; emission spectra.</a> T: Lab: Check-in, discussion of guidelines for lab reports, and practice activities. W: <a href="#">Energy quantization.</a> F: <b>Quiz 1</b>	Light and Matter	<b>4</b>
3	09/04 – 09/08	M: No class (Labor day) T: <b>Lab # 1:</b> Atomic emission spectra W: <a href="#">Wavefunctions; electron configuration of atoms.</a> F: <b>Quiz 2</b>	Atomic structure	<b>5</b>
4	09/11 – 09/15	M: <a href="#">Importance of electrostatic forces in chemistry.</a> T: <b>Lab # 2:</b> Crystal violet kinetics W: <a href="#">Ionic bond energies.</a> F: <b>Quiz 3</b>	Ionic bonds	<b>6</b>
5	09/18 – 09/22	M: <a href="#">Electron pair; Lewis formulas;</a> T: <b>Lab # 3:</b> Acid-base equilibria W: <a href="#">Partial charges and electronegativities.</a> <i>Form groups and assign topics for final presentation.</i> F: <b>Quiz 4</b>	Covalent bonds	<b>7</b> <b>Exam I:</b> <b>Thurs. 09/21</b> <b>FRNY 8 – 9:30pm</b>
6	09/25 – 09/29	M: <a href="#">Shapes of molecules via VSEPR; chirality</a> T: <b>Lab # 4:</b> Riboflavin fluorescence W: <a href="#">Orbital hybridization; polyatomics</a> F: <b>Quiz 5</b>	The structure of molecules	<b>8 - 9</b>
7	10/02 – 10/06	M: <a href="#">Properties of gases.</a> T: <b>Lab # 5:</b> Molecular formula W: <a href="#">Kinetic theory of gases</a> F: <b>Quiz 6</b>	Gases	<b>13</b>
8	10/09 – 10/13	M: No class (October break) T: <b>No lab.</b> W: <a href="#">Properties of liquids</a> F: <b>Quiz 7</b>	Liquids	<b>14-15</b>
9	10/16 – 10/20	M: <a href="#">Properties of solids</a> T: <b>Lab # 6:</b> Polymers W: <a href="#">Crystal structures</a> F: <b>Quiz 8</b>	Solids	<b>15</b>

<sup>1</sup> Subject to change.

10	10/23 – 10/27	M: <a href="#">Enthalpy, internal energy, and specific heat.</a> T: <b>Lab # 7:</b> Conductometric and gravimetric determination of a precipitate. W: <a href="#">Heat transfer in phase transitions and chemical reactions.</a> F: <b>Quiz 9</b>	Heat	<b>15</b> <b>Exam II:</b> <b>Thurs. 10/26</b> <b>FRNY 8 – 9:30pm</b>
11	10/30 – 11/03	M: <a href="#">Rate laws of chemical reactions.</a> T: <b>Lab # 8:</b> Iron in cereal W: <a href="#">More on rate laws.</a> F: <b>Quiz 10</b>	Chemical kinetics	<b>17</b>
12	11/06 – 11/10	M: <a href="#">Activation energies.</a> T: <b>Lab # 9:</b> Activation energy W: <a href="#">Catalysis.</a> F: <b>Quiz 11</b>	Mechanisms	<b>18</b>
13	11/13 – 11/17	M: <a href="#">Equilibrium constants.</a> T: <b>Lab # 10:</b> Intermolecular forces W: <a href="#">Away from and toward equilibrium.</a> F: <b>Quiz 12</b>	Equilibrium	<b>19</b>
14	11/20 – 11/24	M: <a href="#">Meaning of entropy.</a> T: No lab (Compensation for evening exams) W: No class (Thanksgiving break) F: No class (Thanksgiving break)	Entropy	<b>23</b>
15	11/27 – 12/01	M: <a href="#">Free energy.</a> T: <b>Lab # 11:</b> How do we determine $K$ , $\Delta H$ , $\Delta S$ , and $\Delta G$ ? W: <a href="#">Free energy and equilibrium.</a> F: <b>Quiz 13</b> / Presentation scripts due.	Entropy	<b>23</b>
16	12/04 – 12/08	M: Student presentations T: Lab: Check out. W: More presentations F: More presentations	Connection of Chemistry with other fields	