

**CHEMISTRY 11600**  
**General Chemistry**  
**Fall 2022**  
**4.00 Credit Hours**  
**Instructional Modality: Face-to-Face**

**Professor**

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**Course Coordinator**

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**Course Description**

A continuation of CHM 11500. Solutions; quantitative equilibria in aqueous solution; introductory thermodynamics; oxidation-reduction and electrochemistry; chemical kinetics; qualitative analysis; further descriptive chemistry of metals and nonmetals.

**General Chemistry Office**

The General Chemistry Office (BRWN 1144, (765) 494-5250, [genchem@purdue.edu](mailto:genchem@purdue.edu)) handles *all* the administrative (non-chemistry) details associated with the course. Direct all non-chemistry questions about the course to this office. For example, contact us to discuss accommodations, to obtain grade checks, to discuss time conflicts, to get clarification on course policies, to resolve grade issues, and to get signatures on university forms such as add/drop forms. We are able to help you with a variety of requests so you can maximize your success in general chemistry.

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 this course will be posted on [Brightspace](#) and shared via announcements and email

You are expected to read your @purdue.edu e-mail on a frequent basis.

## Learning Resources, Technology & Texts

**Textbook:** The textbook used in Chemistry 11600 is *Chemistry: The Molecular Nature of Matter and Change*, 9<sup>th</sup> Ed., by M. S. Silberberg and P. Amateis. There are several options available for purchasing a paper and/or electronic version of the book, including a loose-leaf version with eBook directly from McGraw-Hill for \$55. See [Brightspace](#) for further information.

**Achieve:** In Chemistry 11600, you are required to complete homework online by using the Achieve program. You can purchase instant access via the link on [Brightspace](#) (\$42 for one semester access) or you can purchase a code from a local bookstore that you can then redeem via the link on Brightspace. If you purchased multi-semester access *in a prior semester*, then you do not need to purchase access again; however, you will need to apply to Achieve by completing the form at: <https://credit.saplinglearning.com>. Note that you will need the correct Achieve course id for the course for which you are enrolling (you can find the id next to the course name on your course list homepage).

**Digital Materials Charge:** Students enrolled in this course must purchase digital materials for lab (\$35). The materials will be released online on a real-time (approximately weekly) basis during the semester. You will purchase access to the digital materials via a Purdue Online link (<http://www.eventreg.purdue.edu/online/CHM2022Fall35>) also available to you in myPurdue and on the [Brightspace](#) page. Payment is due by September 2, 2022.

**Laboratory Materials:** In addition to the digital materials, you are also required to have approved safety (splash) goggles. *Approved safety (splash) goggles must be worn at all times in the laboratory.* Goggles are available for purchase in the local bookstores, or the storerooms in CHAS.

**Office 365:** You can download the Microsoft Teams/OneNote programs for free. Go to <https://www.itap.purdue.edu/shopping/software/product/office365.html> and log in by using your Purdue career account.

**Calculator:** A *simple, battery-operated scientific calculator* with exponential, logarithm and square root functions is needed for exams. You are *not* allowed to use alpha-numeric, graphing and/or programmable calculators for exams. (Two-line non-programmable calculators are allowed.)

## Class Schedule

You are expected to attend all scheduled lectures, one recitation, and one laboratory each week. The lectures are given at 1:30 pm in WTHR 200 on Tuesdays and Thursdays (unless otherwise stated). All labs are held on Wednesdays, and all recitations are held on Tuesdays (see your class schedule).

## Course Information

[Brightspace](https://purdue.brightspace.com) (<https://purdue.brightspace.com>) is the primary course management site for the course. Assignments, announcements, learning objectives, grades, and other course information will be posted on Brightspace. Some of your lab work may be conducted by using Microsoft Teams and/or OneNote ([Purdue Office 365 portal](https://login.microsoftonline.com/): <https://login.microsoftonline.com/>). It will be important for you to learn which site to use for which type of assignment.

## Foundational Core

CHM 11600 meets the science requirement of the University's foundational core.

## Learning Outcomes

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

1. use theory to understand/predict experimental observations,
2. demonstrate an understanding of the physical properties and a molecular understanding of chemical reactivity and materials, and
3. document scientific information and experimental data and write scientific reports, with graphical representation of data.

The course has been designed and structured so that in addition to the treatment of the concepts and topics listed above, there is a simultaneous emphasis on development of problem-solving skills. Laboratories are scheduled weekly and offer an opportunity to reinforce and extend what is discussed in lecture, explore new topics, and to develop your knowledge of chemistry laboratory skills.

## Weekly Assignments

- Attend lecture, recitation and lab.
- Do the reading assignment for lecture.
- Complete your Achieve homework assignment (due each Tuesday at 10:00 pm).
- Read the lab instructions in preparation for lab, and complete the pre-lab practice problems in preparation for the online pre-lab quiz.

## Classroom Guidance Regarding Protect Purdue

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](#). See also [Purdue University Bill of Student Rights](#) and the Violent Behavior Policy under University Resources in [Brightspace](#).

## Academic Guidance in the Event a Student is Quarantined/Isolated

If you must miss class at any point in time during the semester, please reach out to the Course Coordinator via Purdue email so that he/she can communicate about how you can maintain your academic progress. For COVID-19 concerns, please see the [Fall 2022: What you need to know](#) guidance published July 27. If you find yourself too sick to progress in the course, notify your advisor and notify the Course Coordinator via email. He/she will make arrangements based on your particular situation.

## Mental Health/Wellness Statement

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 <https://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of 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 (<https://www.purdue.edu/odos>) for walk-in hours (M - F, 8am - 5pm).

## Diversity Statement

We believe that every student in this course has something of value to contribute. Please take care to respect the different experiences, beliefs and values expressed by students and staff involved in this course. We support Purdue's commitment to diversity, and welcome individuals of all ages, backgrounds, citizenship, countries of origin, disabilities, education, ethnicities, family status, genders, military experiences, political views, races, religions, sexual orientations, socioeconomic status, and work experiences. See: <https://www.purdue.edu/diversity-inclusion/>

## Disability Accommodations

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 (<https://www.purdue.edu/drc/>). To implement accommodations, you must follow the instructions in the letter provided by the Disability Resource Center, *in addition to* doing the following.

**Within the first three (3) weeks of the semester or within one week of the date of the letter**, you are *required to* (1) electronically share a copy of your letter with the General Chemistry Office ([genchem@purdue.edu](mailto:genchem@purdue.edu)) or (2) schedule an appointment via email ([genchem@purdue.edu](mailto:genchem@purdue.edu)) or (3) take a copy of your letter to the General Chemistry Office (BRWN 1144) during walk-in hours to discuss your accommodations. *Implementation of accommodations may not be possible if insufficient notification is given.*

## Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it relates to COVID-19, students may submit requests for emergency assistance from the [Critical Need Fund](#).

### LECTURE SCHEDULE (WEEKS 1-8)

Week	Day	Date	Lecture Topic	Chap. <sup>a</sup>
1	T	8/23	Introduction/Concentration Expressions	4,13
	R	8/25	Thermodynamics: Entropy, Free Energy and The Direction of Chemical Reactions	20
2	T	8/30	Thermodynamics: Entropy, Free Energy and The Direction of Chemical Reactions	20
	R	9/1	Thermodynamics: Entropy, Free Energy and The Direction of Chemical Reactions	20
3	T	9/6	Thermodynamics: Entropy, Free Energy and The Direction of Chemical Reactions	20
	R	9/8	Equilibrium: The Extent of Chemical Reactions	17
4	T	9/13	Equilibrium: The Extent of Chemical Reactions	17
	R	9/15	Equilibrium: The Extent of Chemical Reactions	17
5	T	9/20	Equilibrium: The Extent of Chemical Reactions	17
	R	9/22	Acids & Bases	4,18
**	<b>R</b>	<b>9/22</b>	<b>Exam I: 8:00 pm - 9:00 pm; BHEE 129, PHYS 114</b>	
6	T	9/27	Acids & Bases	18
	R	9/29	Acids & Bases	18
7	T	10/4	Acids & Bases	18
	R	10/6	Acid-Base Equilibria	18
8	T	10/11	<b>NO LECTURE (Octoberbreak)</b>	
	R	10/13	Acid-Base Equilibria	18

<sup>a</sup>Textbook: *Chemistry: The Molecular Nature of Matter and Change*, 9<sup>th</sup> Ed., by M. S. Silberberg and P. Amateis.

### LECTURE SCHEDULE (WEEKS 9-16)

Week	Day	Date	Lecture Topic	Chap. <sup>a</sup>
9	T	10/18	Acid-Base Equilibria	18
	R	10/20	Acid-Base Equilibria	18,19
**	<b>R</b>	<b>10/20</b>	<b>Exam II: 8:00 pm - 9:00 pm; BHEE 129, PHYS 114</b>	
10	T	10/25	Acid-Base Titrations	19
	R	10/27	Reduction-Oxidation Reactions	4,21
11	T	11/1	Electrochemistry: Chemical Change and Electrical Work	21
	R	11/3	Electrochemistry: Chemical Change and Electrical Work	21
12	T	11/8	Electrochemistry: Chemical Change and Electrical Work	21
	R	11/10	Electrochemistry: Chemical Change and Electrical Work	21
13	T	11/15	Kinetics: Rates and Mechanisms of Chemical Reactions	16
	R	11/17	Kinetics: Rates and Mechanisms of Chemical Reactions	16
**	<b>R</b>	<b>11/17</b>	<b>Exam III: 8:00 pm - 9:00 pm; WALC 1055, PHYS 114, PHYS 203</b>	
14	T	11/22	Kinetics: Rates and Mechanisms of Chemical Reactions	16
	R	11/24	<b>NO LECTURE (Thanksgiving Break)</b>	
15	T	11/29	Kinetics: Rates and Mechanisms of Chemical Reactions	16
	R	12/1	Kinetics: Rates and Mechanisms of Chemical Reactions	16
**	<b>M</b>	<b>12/5</b>	<b>“Quiet Period” Begins</b>	
16	T	12/6	Kinetics: Rates and Mechanisms of Chemical Reactions	16
	R	12/8	Kinetics: Rates and Mechanisms of Chemical Reactions	16

<sup>a</sup>Textbook: *Chemistry: The Molecular Nature of Matter and Change*, 9<sup>th</sup> Ed., by M. S. Silberberg and P. Amateis.

## LABORATORY SCHEDULE

Week	Date	Experiment	Possible Points
1	8/24	<b>NO LAB (Compensation for evening exams.)</b>	
2	8/31	Check-in; Lab Safety; <b>Lab 0</b> (Preparation for <b>Lab 1</b> )	
3	9/7	<b>Lab 1:</b> A Chemical Oscillation Reaction	25
4	9/14	<b>Lab 2:</b> Thermodynamics and Equilibrium	25
5	9/21	<b>Lab 3:</b> Bromocresol Green Equilibrium Systems	25
6	9/28	<b>Lab 4:</b> Iron(III) Thiocyanate Equilibrium System	25
7	10/5	<b>Lab 5:</b> Electrolyte and Nonelectrolyte Solutions	25
8	10/12	<b>NO LAB (Octoberbreak)</b>	
9	10/19	<b>Lab 6:</b> How Much Copper Is In a Penny?	25
10	10/26	<b>Lab 7:</b> Acid-Base Equilibria, Part I	25
11	11/2	<b>Lab 8:</b> Acid-Base Equilibria, Part II	25
12	11/9	<b>Lab 9:</b> A Metal Ion Sensor	25
13	11/16	<b>Lab 10:</b> Chemical Kinetics, Part I	25
14	11/23	<b>NO LAB (Thanksgiving Break)</b>	
15	11/30	<b>Lab 11:</b> Chemical Kinetics, Part II	25
16	12/7	Check-out ( <b>You must attend or you will be charged a \$45 failure-to-check-out fee.</b> )	
<b>TOTAL POINTS POSSIBLE</b>			<b>275</b>

### University Deadlines - Fall 2022

**September 2:** Last day to drop (cancel) a course via MyPurdue without it appearing on your record.

**September 19:** Last day to drop (cancel) a course with a grade of "W".

**October 25:** Last day to drop (cancel) a course (with a passing or failing grade).

## UNIVERSITY AND COURSE POLICIES

*“As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.” (Purdue Honors Pledge)*

### Attendance and Absences

*Students are expected to be present for every meeting of the classes in which they are enrolled. (Purdue University policy for attendance)*

You will be responsible for all information, including assignments, policy changes, schedule changes, etc., announced in lecture. Audio/document camera recordings of the lectures will be available on [Brightspace](#).

You are expected to attend all scheduled recitation sessions. Attendance will be recorded during the first ten minutes of each recitation session. ***Any student with three or more absences from recitation will be ineligible for any special borderline considerations when final grades are assigned.***

You are expected to attend all scheduled laboratory sessions. ***Any student who fails to complete three or more labs will be ineligible for any special borderline considerations when final grades are assigned.*** Completion of a lab project includes, but is not limited to, the following components: (a) attendance in the laboratory, (b) participation in the laboratory work, (c) participation in the preparation of the final lab report, and (d) completion and submission of a satisfactory final lab report.

During the first 10-15 minutes of each lab period, your Graduate Instructor (TA) will give a pre-lab lecture in which safety issues related to the experiment will be discussed. ***For your safety, as well as the safety of others, if you are more than 10 minutes late for lab, or if you arrive on time but inappropriately dressed, you will not be allowed to perform the experiment or remain in the lab and you will receive a grade of zero for the experiment. Either of these situations will result in a failure to complete the lab project.***

Verified grief (GAPS), military (MAPS), medical excused (MEAPS), and COVID-related absences are the *only* excused absences in Chemistry 11600. Absence accommodations approved by the Disability Resource Center (DRC) will be handled individually. Contact the General Chemistry Office ([genchem@purdue.edu](mailto:genchem@purdue.edu)) for more information.

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

If you experience the death of a family member or close friend, notify the Office of the Dean of Students (ODOS) at 765-494-1747. Scores for any missed assignments covered under a verified GAPS absence will be either prorated, or you will be given the opportunity to make up the missed work.

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

If you are required to complete mandatory military training, notify the Office of the Dean of Students (ODOS) at 765-494-1747 to request that a notice of the leave be sent to instructors. Scores for any missed assignments covered under a verified MAPS absence will be either prorated, or you will be given the opportunity to make up the missed work.

### **Medical Excused Absence Policy for Students (MEAPS)**

Students may occasionally have to miss class and other academic obligations due to hospitalization, emergency department or urgent care visits, whether physical or mental health related in nature. The intention of this policy is to afford arrangements to students experiencing serious and short-term medical situations which cause them to miss coursework and/or exams. A student should complete the Medical Excused Absence Request Form (<https://www.purdue.edu/advocacy/students/absences.html>) to request that an absence notification be sent to instructors. Scores for any missed assignments covered under a verified MEAPS absence will be prorated (assigned a score based on your average grade for that type of assignment), or you will be given the opportunity to make up the missed work. Contact the Course Coordinator for more information.

### **COVID-19**

For COVID-19 concerns, please see <https://protect.purdue.edu/updates/fall-2022-what-you-need-to-know/>. If you find yourself too sick to progress in the course, notify your adviser and notify the Course Coordinator via email or Brightspace. We will make arrangements based on your particular situation.

#### **Protect Purdue Pledge**

*“Being a part of the Boilermaker community means that each of us must take extraordinary steps to stay well and persistently protect each other, on campus and in the community. Accountable together, I pledge to take responsibility for my own health, the protection of others and help keep the Purdue community safe from spread of COVID-19 and other infections as identified and instructed by the university.”* <https://protect.purdue.edu/pledge/>

The Protect Purdue Plan, which includes the Protect Purdue Pledge, is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Please refer to <https://protect.purdue.edu/> and the course Brightspace page for the most up-to-date protocols.

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](https://www.purdue.edu/odos/osrr/) (<https://www.purdue.edu/odos/osrr/> > Report Concerns > General Incident Report). See also [Purdue University Bill of Student Rights](#) and the Violent Behavior Policy under University Resources in Brightspace.

Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observances, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflict, when advance notification to an instructor is not possible, the student should contact the Course

Coordinator as soon as possible.

When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via e-mail (odos@purdue.edu) or phone (765-494-1747).

The lowest score in each category of graded activity (i.e., homework, recitation participation, pre-lab quiz, lab and exam (or ½ final exam; see below)) is dropped at the end of the semester to account for absences due to illnesses, trips, conflicts or other situations that are not excused absences. This includes internet or related technology issues that may have prevented you from completing a lab report, pre-lab quiz, homework, or exam. If you have concerns about how an absence will affect your course grade, contact your instructor or the Course Coordinator *at the time of the absence*.

### **Classroom Etiquette**

The lectures will begin promptly at 1:30 pm, so please be in your seat by this time. If you must be late, please enter as quietly as possible and sit in the back rows so as not to disturb the class. Please be respectful of your classmates and avoid loud wrappers, opening drinks, reading newspapers, etc. in class. Dr. Nash will do his best to keep the lectures on time and asks that you not leave, or prepare to leave (shuffling papers, etc.) until the class is dismissed.

Cell phones, laptops and other electronic devices not being used for instructional purposes are distracting to everyone in a learning situation. Please respect your classmates and turn off your cell phones in lectures as well as in recitations and labs. Laptops can be used to take notes and follow lecture, but you should not use social media, watch videos, or shop during class. Talking out loud to classmates during lecture is distracting to other students and is disrespectful to Dr. Nash. If you have a question, please ask, but otherwise remain quiet and allow the students around you the opportunity to pay attention.

### **Academic Integrity**

All students are expected to be familiar with Purdue's policies on academic integrity (<https://www.purdue.edu/odos/academic-integrity/>).

Academic integrity is one of the highest values that Purdue University holds. Students who observe an issue of academic integrity can report it to the Office of the Dean of Students (<https://www.purdue.edu/odos/> - use the General Incident Report to report anonymously), call 765-494-8778, or e-mail [integrity@purdue.edu](mailto:integrity@purdue.edu).

*"Dishonesty in connection with any University activity may result in informal action or disciplinary sanctions. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." The commitment of acts of cheating, lying, stealing, and deceit in any of their diverse forms (such as the use of ghost-written papers, the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest."*

From University Senate Document 72-18.

Some examples of academic dishonesty are listed below. While this is not a complete list of examples of academic dishonesty, these examples are provided for your information. If you have any questions at all about permissible behavior, you should ask before acting.

- Copying or possessing an unauthorized crib or unauthorized information (written or electronic) during an exam.
- Copying from another student's exam or work; allowing another student to copy your exam or work.
- Copying lab data or a lab report; giving your data or lab report to someone else to copy. This includes files on computer disks 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 in a lab report as if it were your own.
- Submitting a lab report or other work that you did not do.

In Chemistry 11600, academic integrity means “doing your own work” at all times. Discussion of chemical concepts is encouraged, but sharing your answers and work on social media for the express purpose of letting other students copy it is not acceptable. Such a use of technology does not help you learn the material and is considered academic dishonesty.

Online (pre-lab) quizzes in Chemistry 11600 are “open book” and “open note”; however, all collaboration with others (such as Group Me, Zoom, discussion boards, text, in-person, etc.) during a quiz is prohibited.

Using online resources such as Chegg to gain answers to any graded assignment (including homework, labs, and pre-lab quizzes) is *not* allowed. Posting course materials to web sites is a violation of copyright laws and is *not* allowed. The Chemistry 11600 instructors can obtain user information from Chegg and other sites when inappropriate course material is posted. This information will be investigated.

Consequences of academic dishonesty include receiving a lower or failing grade for an assignment, being required to repeat the assignment, receiving a lower or failing grade for the course and/or dismissal from the University. All incidents of academic dishonesty 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.

This Course Packet is a contract between Chemistry 11600 students and the instructor. If a student violates the contract by committing an act of academic dishonesty, the instructor reserves the right to alter the terms of the contract (including grading policies) at his/her discretion.

## Homework

Each week you will have a reading assignment. Reading assignments will be posted on [Brightspace](#). Reading the assigned material prior to lecture and laboratory is strongly recommended. Some of the material will be covered in lecture and some on your own.

Each week you will have a homework assignment on the online Achieve system (see Brightspace for the link). **Unless otherwise stated, each homework assignment will be posted on Friday and will be due on the second Tuesday (at 10:00 pm) after it is posted (i.e., about ten (10) days after it is assigned).** Due dates will be listed on Brightspace and the Achieve assignment page.

There will be fourteen (14) graded homework assignments in this course. Each homework assignment will be scaled to 10 points, for a total of 140 points. The lowest homework score will be dropped at the end of the semester to account for illnesses, trips, technical difficulties and other situations.

You will have five (5) attempts for each question in an assignment. There is no penalty for failed attempts.

***No time extensions are possible for Achieve homework assignments.*** Allow plenty of time to do your homework and get the highest possible score. If you wait until the last minute, you risk the possibility of technical difficulties, illness, or other situations interfering with your success. **For help with technical issues, contact Macmillan customer service at 1-800-936-6899 or use the online form at <https://macmillan.force.com/macmillanlearning/s/contactsupport>. Supported browsers are Chrome 64+, Firefox 57+, or Safari 11+. Achieve does not support Microsoft Edge due to issues it presents with some module types.**

## Recitation

Weekly recitation provides the opportunity for you to ask questions and work problems with your peers and TA. Your questions are always the first agenda item, so come prepared.

Take your textbook, lab materials, homework, calculator, and/or any questions that you have regarding the course to recitation.

Attendance at recitation is required. Recitation participation is worth two (2) points per week. If you miss recitation for a reason other than GAPS, MAPS, MEAPS, or COVID-19, then you will receive no participation points for that week. One recitation participation score will be dropped at the end of the semester; that is, you may miss one recitation without penalty to your final point total in the course.

Note that it is not your TA's responsibility to provide you with answers to homework, pre-lab, or lab report questions. Rather, they are expected to guide you to the correct solutions, help you identify mistakes, and add details to help you further understand concepts.

## Exams

Exams are a chance for you to demonstrate your comprehension of the course material and are worth approximately 60% of your final grade. Your lowest exam score, or  $\frac{1}{2}$  of your final exam score, whichever is lower, will be dropped at the end of the semester.

There will be three exams and a ***comprehensive final exam*** in this course. You should plan to arrive at least 15 minutes before the exam start time. You will also need to bring a simple, battery-operated scientific calculator, several sharpened #2 pencils, and your student ID with you to each exam. There will be no "spare" calculators available during exams, and you may not share a calculator with another student. Cell phones, and graphing, programmable and alpha-numeric calculators, may not be used during exams. (Two-line non-programmable calculators are allowed.) The date and time of each exam is given below.

Exam I	140 points	Thursday, September 22; 8:00 pm - 9:00 pm; BHEE 129,PHYS 114
Exam II	140 points	Thursday, October 20; 8:00 pm - 9:00 pm; BHEE 129,PHYS 114
Exam III	140 points	Thursday, November 17; 8:00 pm - 9:00 pm; WALC 1055,PHYS 114,PHYS 203
Final Exam	280 points	To be announced; during finals week

You will not be allowed to leave the examination area during the first 15 minutes of the scheduled exam time. You may arrive late for the exam during this first 15-minute window; however, you will not receive additional time to complete the exam. After the first 15 minutes, no one will be allowed to enter the examination area or take the exam.

If you have a direct conflict with another exam, class, or required university activity, contact the General Chemistry Office (BRWN 1144) **at least one week before the conflict**. You will be asked to provide written verification of the conflict. If an emergency occurs, contact the General Chemistry Office as soon as possible.

## **Final Exam**

You should 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.*** Additional information about the final exam, when available, will be announced and posted on [Brightspace](#).

There is no make-up exam if you miss the final exam. You must arrive within 15 minutes of the exam start time to be eligible to take the final exam. If you arrive more than 15 minutes after the start time, you will not be permitted to take the final exam.

University policy on final exams states: “*Students scheduled for more than two (final) examinations in one calendar day are entitled to reschedule any examination in excess of two... It is the responsibility of the student to make necessary arrangements before the last week of regularly scheduled classes.*”

## Total Points

Each of the assigned course activities for Chemistry 11600 is worth the number of points listed below. Before final course grades are assigned at the end of the semester, the following scores will be dropped:

- your *one* lowest homework score
- your *one* lowest recitation participation score
- your *one* lowest pre-lab quiz score
- your *one* lowest lab project score (provided you have completed at least 8 of the 11 projects)
- your *one* lowest exam score or  $\frac{1}{2}$  your final exam score, whichever is lower

Exams I - III	420 pts.	(3 at 140 pts. each)
Final Exam	280 pts.	(comprehensive)
Homework	130 pts.	(best 13 of 14 at 10 pts. each)
Recitation	26 pts.	(best 13 of 14 at 2 pts. each)
Pre-Lab Quizzes	100 pts.	(best 10 of 11 at 10 pts. each)
Labs	150 pts.	(best 10 of 11 at 15 pts. each)
<b>Sub-total</b>	<b>1106 pts.</b>	
	-140 pts.	drop lowest exam or $\frac{1}{2}$ final exam score, whichever is lower
<b>Total</b>	<b>966 pts.</b>	

## Saving Graded Materials

You should save all of your graded materials until after you have received your final letter grade for the course. In order to resolve any discrepancies, your graded materials will need to be reviewed.

## The Grading Scale

At the end of the semester, the total scores for all students will be arranged in numerical order, the score that corresponds to either the 99<sup>th</sup> or 98<sup>th</sup> percentile ( $S_{99}$  or  $S_{98}$ ) will be determined, and then letter grades will be assigned based on this percentile score as follows:

- A: Total Score  $\geq 0.90 \times S_{99}$  (or  $S_{98}$ )
- B:  $0.80 \times S_{99}$  (or  $S_{98}$ )  $\leq$  Total Score  $< 0.90 \times S_{99}$  (or  $S_{98}$ )
- C:  $0.70 \times S_{99}$  (or  $S_{98}$ )  $\leq$  Total Score  $< 0.80 \times S_{99}$  (or  $S_{98}$ )
- D:  $0.60 \times S_{99}$  (or  $S_{98}$ )  $\leq$  Total Score  $< 0.70 \times S_{99}$  (or  $S_{98}$ )
- F: Total Score  $< 0.60 \times S_{99}$  (or  $S_{98}$ )

At various times during the semester, this approach will be used to create *tentative* grading scales which you can use to see how well you are doing in the course. This system has several advantages. It lets you know several times during the semester how you are doing in the course. Unlike a *curved scale*, it encourages cooperation among students because no student is penalized when another is successful. Unlike an *absolute scale*, it tends to neutralize the effects of differences from one semester to another and

thereby ensures that the same criteria are used to assign grades from one semester to another.

This approach to grading means that the grade you get in this course depends primarily on *your own* effort and performance. *It also ensures that all students who do well in the course will get good grades.*

Check all of your scores on Brightspace regularly. If there are errors or discrepancies, notify the Course Coordinator within two weeks of a grade update being announced.

### **Dropping the Course / Lab Drawer Check-Out**

If you drop Chemistry 11600 after having checked into a lab drawer, 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 lab drawer equipment.

On the last day of lab, 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 will be assessed a fee of \$45.

## **SOURCES OF HELP**

### **TA Office Hours**

Chemistry 11600 TAs will hold office hours each week in WTHR 261 where any Chemistry 11600 student can go to get help with chemistry at no charge. You should feel free to see any of the TAs, not just your own! Note that the TAs in the Department of Chemistry are not 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 them have several years of experience in teaching. Feel free to go to the office hours with a classmate or small group if you feel uncomfortable going alone. The schedule for instructor and TA office hours will be posted on Brightspace.

### **Course Supervisors / Professor**

You can make an appointment with either the Course Coordinator, Lab Supervisor, or the Professor. E-mail addresses (the best way) and phone numbers are on the cover page of this packet.

### **Supplemental Instruction (SI)**

There are Supplemental Instruction (SI) study sessions available for this course. These study groups are open to anyone enrolled in this course who would like to stay current with the course material and understand the material better. Attendance at these sessions is voluntary, but extremely beneficial for those who attend regularly. Times and locations for the help sessions can be found here: <https://www.purdue.edu/si> or on the PurdueGuide app (<https://www.purdue.edu/asc/PurdueGuide.html>). Students who attend these interactive sessions will find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Students are asked to arrive with their student ID card, lecture notes and questions to these informal, peer-led study sessions. Visit [Brightspace](#) to access information about connecting with SI sessions for your course(s).

This semester, our SI Leader is Ms. Ashlyn Cochran. She will have SI sessions on Mondays and

Wednesdays at 6:30 pm in LILY 3102. Her office hour will be Mondays at 11:00 am in WILY C215.

## Resource Room

The staff in this area can answer many of your chemistry related questions but going to a Chemistry 11600 TA with your chemistry questions is recommended. The Chemistry Resource Room is also an area where you can study alone or with others. Various kinds of help for all chemistry students are available. The resources include:

- Free help and tutoring from the staff assigned to this area
- Numerous audio-visual, auto-tutorial programs on chemistry
- Molecular and crystal models
- Computers with a variety of chemical, tutorial topics

A student ID card is required to check out most of the materials in the Chemistry Resource Room. Days and times when the Chemistry Resource Room is scheduled to be open will be posted outside WTHR 117.

## LABORATORY PROJECTS

Laboratory projects are an integral part of Chemistry 11600 and are an opportunity for you to experience the chemical concepts discussed in lecture in a practical way. Digital lab materials (instructions, materials, and reports) will be provided in a OneNote Class Notebook specific to your lab section. Pre-lab quizzes will be completed on [Brightspace](#).

You will be working in teams of two (pairs) for all of the lab experiments. No students will be allowed to work individually in lab. While we encourage you to discuss concepts with other members of your class, each lab report must represent the *unique effort of each team of two students*. No *individual* lab report worksheets will be accepted, or graded.

## Laboratory Attendance and Participation

Lab attendance is required since Chemistry 11600 is a laboratory course. There are no make-up labs or excused absences, except those that are verified as COVID-related or covered by the GAPS, MAPS or MEAPS policies (see above).

If the Protect Purdue Health Center (PPHC) or the Indiana State Board of Health directs you to quarantine or isolate and you miss a lab, then you must contact the Course Coordinator to request a replacement assignment *within one week* of the end of your quarantine/isolation period. You must also forward your PPHC documentation to [genchem@purdue.edu](mailto:genchem@purdue.edu).

For cases such as those listed below, a score of zero (failure to complete) will be assigned.

- being absent for any reason (except GAPS/MAPS/MEAPS or verified COVID-related absences)
- being dismissed from lab for an incomplete Safety Certification (score < 20/25)
- being dismissed from lab for safety violations, including dress and goggle violations
- arriving more than ten (10) minutes late
- leaving lab early or otherwise not completing the lab project
- inadequate preparation that hinders lab participation
- not contributing constructively to the group's work in lab

- not recording appropriate data and/or observations during lab
- failure to submit a lab report, even if you attended the lab

### Pre-Lab Quizzes

There will be a quiz (on [Brightspace](#)) based on the lab procedure and the pre-lab practice questions before each lab. The purpose of these quizzes is to ensure that you have adequately prepared for the lab by reviewing the concepts and procedure.

- You have one, timed (10-minute) attempt for each quiz. The quiz will automatically submit after 10 minutes. Do not click “Begin” until you are ready to take the quiz because you cannot pause, exit, cancel, resume later, etc.
- For the best chance of success, take the pre-lab quiz after reading the lab materials and completing the pre-lab practice questions. You are encouraged to use the digital lab materials and your work for the pre-lab practice questions while taking the quiz.
- Quizzes are individual assignments. Collaboration with other students during the quiz is not allowed. (However, you are encouraged to work together in advance to complete the pre-lab practice questions.)
- Pre-lab quizzes are due each week on Sundays by 11:59 pm.
- If you do not attempt the quiz before the time it is due, then you will receive a zero for the quiz (out of ten (10) points). You are, however, allowed to attend lab and can still earn points for the lab report (15 points).
- There are no make-up quizzes or time extensions. The lowest pre-lab quiz score is dropped at the end of the semester to account for illnesses, technical difficulties, and other situations.

### Laboratory Reports

For each lab project, you and your lab partner will complete and submit a single lab report. Be sure to complete the lab report appropriately (see below).

- answer in full sentences for open-ended questions
- **make sure your handwriting is clear and legible if you are using a stylus on a tablet or uploading photos of your handwritten notes**
- enter your answer(s) in the space(s) provided
- label graphs and tables clearly
- show calculation steps clearly for mathematical questions
- show the use of correct units of measurement and significant figures
- ensure results and conclusions are consistent with your data and observations

You are encouraged to access lab materials and notes while completing the reports. Also, you may discuss your report with peers and your TA; however, you and your lab partner must do your own work.

**Each lab report will be due at the end of the lab period in which the experiment was performed.** Your TA will inform you how to submit them. It is recommended that *both* you and your lab partner review your graded lab reports (available approximately one week after submission) because exams are likely to include lab-related questions. If you have questions about a lab report, speak with your TA or the Lab Supervisor **within one week** of the report being made available to you.

Lab reports are worth fifteen (15) points each. The lowest lab report score will be dropped at the end of the semester to account for illnesses, trips, conflicts and other situations. Lab reports submitted after the due date (end of lab), up to 24 hours late, are worth 50%. Lab reports submitted after 24 hours are worth

no (zero) credit.

## **Laboratory Equipment Policies**

You will share an assigned laboratory drawer of equipment with the student(s) at your lab table. Your lab partner(s) will depend upon your commitment to keeping the equipment clean and in good working condition.

You and your lab partner(s) will have the opportunity to assess the equipment during check-in. Check-in is your chance to replace, at no charge, equipment that is unusable (i.e., dirty, chipped, cracked, stained, broken, etc.). It is important that you inspect all pieces of equipment carefully.

### **After Check-In**

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, rinsing with tap water, and then rinsing with deionized water. By using this three-step process for cleaning glassware, you will have better experimental results.

If you are responsible for a piece of equipment becoming unusable (i.e., the piece becomes chipped, cracked, stained, broken, etc.), then 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 lab table and in the lost and found box in the lab. If the piece is still missing, then your group must replace it immediately. The storeroom staff can split the cost of a replacement among all or any number of lab partners.

Often, pieces of equipment are broken accidentally; for example, a thermometer rolls off the table 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 (such as goggles) in the drawer, but you should label everything with your name.

### **Changing Lab Sections / Dropping the Course / Withdrawing from the University**

If you change sections, drop the course, or withdraw from the University, then 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 (e.g., dirty, broken, chipped, missing, etc.).

- **You must check out of your lab drawer by the last scheduled lab session or you will be assessed a \$45 fee plus any equipment costs.**
- **You must check out of your lab drawer during your scheduled lab period. Contact the Course Coordinator if you need to make alternate arrangements to check out.**
- Inform the storeroom staff immediately if you are changing lab sections, dropping the 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 lab drawer before you are released from your responsibility for the items in the drawer.

- If you **change sections**, then you are still required to properly check out of your current lab drawer before checking in to another section.
- If you **drop, or withdraw** from, the course before the end of the semester, then you are still required to properly check out of your lab drawer.
- If you have any questions about properly checking out of your lab drawer, go to the storeroom, CHAS 1041 or CHAS 4039, for assistance.

### Check-out Day

On the last day of lab, 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 will be assessed a fee of \$45 for failure to check out.

You and your lab partners will clean and inventory the drawer for your TA's inspection. All missing or unusable equipment must be replaced at this time.

## TEACHING LABORATORY SAFETY 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.*

You must complete the online safety certification found on [Brightspace](#) with a score of 20/25 or better by 11:59 pm on Sunday, August 28. You must confirm your score in the Brightspace grade book. You will be sent home and will receive a zero for *each* lab you miss due to an incomplete safety certification.

### Safety (Splash) Goggles

***Approved safety (splash) goggles must be worn at all times in the laboratory (including during clean up and the day of check-out).*** If you are in lab and your goggles are not covering your eyes, then you will be sent home and will receive a zero for the lab and the lab report (failure to complete).

### Appropriate Clothing

*Each student must wear clothing in the laboratory that covers, and protects, the skin from the neck (including the shoulders) to the ankles, feet, and toes when sitting, standing or reaching. **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
- loose-knit sweaters that expose your skin
- 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 (i.e., shorter than floor-length)
- 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

Your best option for lab attire is a crew neck t-shirt, jeans without holes, and sneakers with socks.



### Gloves

Gloves serve two purposes; they protect your skin from potential contaminants and keep any potential contaminants inside the lab. You should wear protective gloves when directed to do so. When you leave the lab, take the gloves off and throw them away. Get new gloves when you return to lab.

### Contact Lenses / Hair

Wearing contact lenses in the laboratory is not a wise idea; you are encouraged to wear glasses instead. If you wear contact lenses in the laboratory, you must inform your TA of this at the beginning of the semester. If your hair is longer than shoulder length, then you must tie it behind your head in order to avoid contact with chemicals that might be on the lab bench. Rubber bands are available in the laboratory.

### Food & Beverages

Food and beverages are no allowed in the laboratory. *This includes water bottles.*

### Hazardous Materials / Disposal of Waste

Follow your Graduate Instructor's guidance on appropriate handling of hazardous materials and disposal

of chemical waste. Promptly clean up spills, and the laboratory before leaving.

## HOW TO STUDY FOR CHEMISTRY 11600

It will take you at least two hours on your own for every hour we spend in class in order to study and learn the material. This means you will spend about 8-12 hours of distraction-free studying and working with chemistry each week. You may spend this time reviewing and annotating your lecture notes, reading the text, doing homework, working practice problems, studying for quizzes/exams, or other things. You may find yourself spending *more than* 8-12 hours per week if your math skills need improvement or if it has been a few years since you took a chemistry course. If you are committed to your goals and dreams, then dedicate yourself to spending the necessary time to perform well.

### Before Lecture

- Review your notes from the previous lecture.
- Review the assigned reading and read the sample problems within the assigned section(s) of the textbook.

### Use the textbook in ways that work best for you.

- Use the textbook as a reference when you study your lecture notes. Fill in any gaps and correct any information.
- Processing technical information will be more effective in the absence of Netflix, TVs, radios, headphones, etc. Turn your phone on silent and set it aside.
- With technical material, the subheadings often carry important information. This is different from chapter headings in a novel that usually contain no information.
- Read technical material (like your chemistry textbook) differently than you would read a novel. Read in short “chunks” and give yourself time to reflect and interpret the information presented. With technical material, it is often difficult to pick up the “story” in the second paragraph if you did not process the first paragraph.
- Try the problems in the textbook *without* looking at the solutions! If you have understood what you have read, then you should be able to do the problems. First, cover the solution and try the problem. Second, quickly look at the answer to see if you are correct. If your answer is incorrect, try re-reading the section to see if you missed anything. Third, look at your work again to find your mistake. Fourth, look at the solution of the problem presented in the textbook. *The key is to force yourself to recall and apply material.*

### During Lecture

- Take notes!
- Write down each step of every problem or example even if you do not understand the step. You can always ask about it later.
- Try to answer all the questions and work all the problems that the professor presents.
- Write a question mark next to things you don't understand so you can return to them after class.
- Use shorthand or abbreviations so that you can write quickly, but understandably.
- Periodically note the time in the margin of your notes so that you can quickly find a certain section of the lecture when you review the lecture recording.
- Turn off distractions (e.g., Netflix, other homework, social media, ,etc.)

### **After Lecture**

- Review your notes while things are still fresh in your mind.
- Listen to the lecture recording to fill in things that you missed.
- Attend Graduate Instructor (TA) office hours to ask questions and get help.
- Never miss lecture. Chemistry is cumulative. What is presented tomorrow depends upon your knowledge of what was covered today. If you will miss class, then get a friend to take notes for you or get the notes from the recording.

### **When Should I Do the Homework?**

- Do some work in chemistry every day. Work *at least* two chemistry problems each day. If you are drawing a blank about the problem after 5-10 minutes, then go on to another problem. After a day or so, work related problems in the textbook.
- Review your class notes and the assigned section(s) in the textbook *before* you attempt any of your homework problems.
- Seek help from a TA during recitation or office hours.

### **Practice, Practice, Practice!**

- Work additional problems at the end of each chapter that were not assigned as homework.
- Look for similarities and differences in problems (e.g., homework questions, lecture examples). Classify problems by the type of knowledge that is needed to solve the problem.

## EMERGENCY PREPAREDNESS

Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus.

- For any emergency, call 911.
- There are nearly 300 Emergency Telephone Systems throughout campus that connect directly to the Purdue Police Department (PUPD). If you feel threatened or need help, push the button and you will be connected to the PUPD.
- If we hear a fire alarm, we will immediately evacuate the building. During lecture, we will proceed to the areas in front of CL50 and LOEB. During lab, we will proceed to the area between SCHL and HOVD (basement labs) or the north entrance to the Armory (AR). **Do not use the elevator!**
- If we are notified of a Shelter in Place requirement for a tornado *warning*, we will shelter in the lowest level of this building away from windows and doors. Our preferred location is the *basement* of WTHR or BRWN (lecture, recitation) or CHAS (lab).
- If we are notified of a Shelter in Place requirement for a hazardous materials release, we will shelter in our classroom shutting any open doors and windows.
- If we are notified of a Shelter in Place requirement for an active threat such as a shooting, we will shelter in a room that is securable preferably without windows. During lecture, we will shelter in WTHR 200. During lab, we will shelter in the lab.

“**Shelter in Place**” means seeking immediate shelter inside a building or university residence. 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 e-mail 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.