

CHEM 1780-2 | General Chemistry II

CHEM 1780 involves the study of chemical reactions, their kinetic and thermodynamic characteristics. In particular, acid-base and reduction-oxidation (redox) reactions will be emphasized. The course concludes with a discussion of nuclear chemistry.

Catalog: Continuation of 1770. Recommended for physical or biological science majors, chemical engineering majors, and all others intending to take 3000-level chemistry courses.

Lectures / Recitations / Hour Exams / Final Exam

3 credits = 2 lecture hours + 1 recitation hour per week

- Lectures for CHEM 1780, Section 2 meet **Mon/Wed 1:10-2:00 pm** in **1352 Gilman Hall**.
- Recitation sections meet on Fridays:

N:	8:50-9:40am	1811 Gilman
P:	9:55-10:45am	1811 Gilman
Q:	11:00-11:50am	1813 Gilman
S:	1:10-2:00pm	1813 Gilman
T:	2:15-3:05pm	1811 Gilman

3 Hour Exams: **Sep 25, Oct 23, and Dec 4** (all Wednesdays during the lecture period) in **1352 Gilman Hall**.
See Exam policies under [Assessments](#).

Final Exam: Tuesday, **Dec 17**, Noon-2:00pm in **1352 Gilman Hall**. See Final Exam policies under [Assessments](#).

Instructor Information (Fall 2024)

Instructor: Gordon Miller

E-mail: chem1780-2q@iastate.edu

Phone: 515-294-6063

Office: 2110 Hach Hall

Office Hours: Prof. Miller will be available immediately following each lecture period.

Individual in-person visits must be set up by appointment. Prof. Miller is available by appointment Monday-Thursday. Please communicate via e-mail at least 24 hours (48 hours on week-ends) prior to any appointment and indicate at least two scheduling options.

Head TA: Sunera Wijeratne

E-mail: chem1780-2q@iastate.edu

Office Hours: The Head TA will be generally available immediately following each lecture period and will have a weekly office hour in 1761 Gilman Hall (the *Martha Russell Chemistry Help Center*).

Contacting the Instructor or Head TA outside the lecture periods:

We encourage you to contact the Instructor or Head TA using **e-mail** (chem1780-2q@iastate.edu) for questions/concerns that are personal in nature, e.g., scheduling an appointment, seeking accommodation, etc. Response time is approximately 24 hours.

All e-mails to the Instructor, the Head TA, or to your recitation TA are formal communications. Therefore, proper written etiquette and correct English spelling and grammar are expected. The *Subject line* on your email must contain "Re: CHEM 1780" followed by a brief description of the message topic. If the topic of your message to your Instructor involves your TA, *be sure to provide your TA's name*. Any matters which the Instructor feels are of interest to the class will be addressed during lecture or by an announcement via Canvas.

General Learning Objectives and Outcomes

By successfully completing CHEM 1780, students will be able

- to recognize kinetic and thermodynamic features of chemical reactions.
- to evaluate the important characteristics of chemical and physical equilibria.
- to recognize acid-base reactions.
- to recognize reduction-oxidation (redox) reactions.
- to represent any chemical process using a balanced chemical equation.
- to understand fundamentals of nuclear decay processes.

For specific learning objectives, please see the CHEM 178 Canvas website.

Prerequisites

(CHEM 1770; CHEM 1770L), or CHEM 1670*, or CHEM 1630*

CHEM 1780 involves the study of chemical reactions and will emphasize acid-base and reduction-oxidation (redox) reactions. Material in this course builds off certain foundations set in CHEM 1770. Aspects of these foundations are also presented in CHEM 1670 and CHEM 1630. If you need to review key topics from these courses, the following list identifies those topics (with Chapters/Sections from the required textbook for CHEM 1780) that you may review as the semester progresses:

- *Stoichiometry*: Balancing chemical equations, converting between mass and moles, performing stoichiometric calculations, limiting reagents (Chapter 3)
- *Types of Chemical Reactions and Solution Stoichiometry*: Electrolytes, molarity, acid-base reactions, oxidation-reduction reactions (Chapter 4, Sections 1-3, 8-9)
- *Gases*: Ideal gas law, partial pressures (Chapter 5, Sections 3-5)
- *Thermochemistry*: First law of thermodynamics, enthalpy, calculating enthalpies of chemical processes (Chapter 6)
- *Lewis Structures*: Drawing simple Lewis structures, resonance, covalent bond strengths and lengths (Chapter 8, Sections 7-12)

* If you are using CHEM 1670 or 1630 to satisfy the prerequisite for CHEM 1780, please see the "Course Information" module for a more detailed description.

Course Format

In-person lectures and recitations over 15 weeks. Lectures will follow the course schedule - any changes will be announced during the lecture periods. Students are expected to read the assigned text material and/or view the videos before coming to lecture. Lectures will use PowerPoint and some board work along with occasional demonstrations and in-class problem solving.

- All lectures will be captured (video of screens + audio) and posted in Canvas.
- Previews of lecture slides (PDF format) are available on Canvas. It may be helpful to print or save them to your personal computer for use during the lecture periods.

Recitations are directed by graduate or undergraduate teaching assistants (TAs), and are intended for discussion of problems concerning the week's topics. During each recitation (15 total), there will be a worksheet. TAs will hold office hours in the *Martha Russell Chemistry Help Center*, 1761 Gilman Hall. The schedule of TA office hours is posted in Canvas.

Required Textbook and Supplies

- *Chemistry* (10th Edition), S.S. Zumdahl, S.A. Zumdahl, D.J. DeCoste, G. Adams (2018), Cengage Learning: Boston. (ISBN: 978-1-305-95757-2).
- OWLv2 online homework.
- A TI 30X IIS scientific calculator with basic functions including logarithms and exponential functions.

This course is enrolled in the Iowa State University *Immediate Access ONE Program*.

What is Immediate Access ONE?

This is the next stage of the ISU Book Store's successful Immediate Access program. This is a digital-first, flat-rate course materials program launching Fall 2024 for all undergraduate students, designed to boost your success.

Immediate Access ONE provides a predictable cost of \$259 per semester for all undergraduate students, regardless of your major. On the first day of classes of every semester, you can easily access and start using your required course materials by simply logging into your Canvas account.

You are automatically enrolled in this program, so you don't need to sign up.

What is the cost of this program and how is the student billed?

Each undergraduate student is assessed a \$259 charge in the Fall and Spring Semester. The charge is \$69 for Winter and Summer terms. This charge includes all required print and digital titles regardless of major. On your u-bill in Student Workday you should see a transaction description "University Bookstore-Immediate Access ONE Program-Textbooks".

Can I opt out of Immediate Access ONE?

Yes, students have the option to opt out of Immediate Access ONE via Canvas within the **first 10 days from the start of classes**. If you opt out during this period, you will receive a refund. If you change your mind, you can also re-enroll in Immediate Access ONE via Canvas within the first 10 days of classes.

Please note that the opt out button may not appear until shortly before classes start as when it shows up can depend on when your instructor creates the Canvas course or has published it.

How do I access the required digital content?

Click on the **Immediate Access** link located on the **Canvas course** on the **left side Navigation menu**.

After you click on the link you will see item cards with the titles. For e-books you can simply click on the "Read Now" button on the item card. For all digital content, such as homework platforms, there will be instructions on the item cards on how to access your digital content.

How do I get my print materials?

Required print materials are available for pick up at the Iowa State University Book Store located in the Memorial Union. Students will receive an email from the bookstore shortly before classes start on how and when they can pick up those required print materials.

For more information on Immediate Access ONE and other FAQs go to

<https://www.isubookstore.com/immediate-access-one-students>.

For further questions about Immediate Access please email immediateaccess@iastate.edu.

Course Resources on Canvas

The Canvas page for CHEM 1780-2 contains the information and links to the various resources and assessments. Please familiarize yourself with these pages. Under *Modules*, you will find:

- **Course Information:** Syllabus, Schedule, Contact Information, TA and SI Information, Course Technology Requirements.
- **Cengage Information:** Accessing OWLv2 and e-textbook. Click the "FIRST TIME..." link just for the first time you try to access the e-textbook or the OWLv2 problems.
- **Weekly Activities / Assessments (Weeks #1-15):** Links to Review Questions, OWL mastery problems, and lecture slides and audio/video capturings.
- **Topical Modules (7):** Learning Objectives, Video Presentations, Slides, and Notes, which were created for the on-line offerings of this course during Academic Year 2020-2021.

Canvas Help

General help with Canvas can be found under the **Help** link in the global navigation menu on the left side of your Canvas page.

Basic Troubleshooting (if Canvas is not working)

- Username/Password not working?
 - Login information (username and password) for Canvas is the same as for your ISU email account.
 - For help with Username and Password, please visit [University Accounts](#) or contact the Solution Center at 515-294-4000 or solution@iastate.edu.
- If you get an error message, check for browser and Java Issues on your computer.
- If you are unable to access course content or activities (e.g., modules, assignments, etc.), contact your instructor/Head TA at chem1780-2q@iastate.edu.

Important Dates in the Semester

August 26:	Class work begins
August 30:	Last day to drop a course and not appear on permanent record; last day to process schedule changes without fee; last day to change schedules using Workday Student.
September 6:	Last day to audit a course. The audit <u>does not</u> count towards full-time student status.
October 4-18:	Mid-term recitation evaluations administered on Class Climate
November 1:	Last day to drop a course or withdraw without extenuating circumstances
December 2-13:	End-of-semester course evaluations administered on Class Climate
December 6:	Last day to request an alternate time to take the final exam in case of a legitimate conflict

Assessments

- **Exams:** Three exams are scheduled for **Sep 25**, **Oct 23**, and **Dec 4** (all Wednesdays) during the normal lecture period in the lecture classroom. The exam format is multiple choice and the last page of the exam booklet will be an Information Sheet containing useful equations, conversions, and data.

Question and Answer sessions for each exam will be offered by the head TA, but the exact date, time, and location will be announced later in the semester and posted on Canvas.

To avoid a zero score for a missed hour exam, documentation of a valid reason (e.g., serious medical situation or family death) is required. The Thielen Student Health Center does not provide documentation for excuses to miss exams. Make sure you do not plan or take a trip that is not officially sanctioned in writing by ISU or by a branch of the military, and that causes you to miss an hour exam. Pre-booked vacation flights are not valid excuses. If the excuse is approved by Prof. Miller, your other two exam scores will be used to determine your missing score. *A student missing two exam scores will be asked to drop the course.*

Your graded exams will be returned during the recitation period following the exam. If you suspect an error in the grading of an exam, you must bring it to the attention of your TA *before leaving the recitation class on the day the exam was returned to you.*

The Right-To-Privacy Act prohibits disclosure of exam scores over the phone or by e-mail.

- **Lecture/Topic Review Questions:** Each week, 5 multiple-choice questions about material covered during the current week are to be completed in Canvas. Each assignment becomes available on Monday and must be completed no later than 11:59pm on Thursday night of that week. You are allowed 2 attempts; you have 30 minutes to complete each attempt once you start; and the higher score will be counted. There are no exceptions to this policy and no extensions or make-ups for Review Questions will be granted.
- **OWLv2 Mastery Problems:** Login to the OWLv2 homework system through the Canvas CHEM 1780-2 course page (see the module "Cengage Information..." for your first access). There are 15 OWLv2 assignments throughout the semester. ***See the Canvas course page for due dates.*** Late OWLv2 assignments will receive a 10% penalty if completed after the posted due date/time and before the date/time when the assignment becomes unavailable. There are no exceptions to this policy and no extensions or make-ups for OWLv2 HW assignments will be granted.

These mastery problems are designed to help you learn a topic before moving on to the next one. If you need practice or reminders of how to enter information into the answer boxes, please use "OWLv2 Getting Started/How to enter Chemical Formulas, etc (Not Graded)" assignment in the OWLv2 platform of Cengage.

- **Recitation Worksheets:** During each recitation period, every student is expected to actively participate and complete a one-page worksheet on the week's material. These worksheets are not quizzes and are meant to stimulate questions and discussions during recitation as well as to prepare students for the exams. They are to be handed in at the end of the recitation period. The best 10 worksheet scores will count toward the final grade. No make-up of any missed worksheet is allowed. A blank copy and answers of each worksheet will be posted on the Friday after recitations are completed.
- **Final Exam:** A comprehensive exam on Tuesday **Dec. 17** from Noon-2:00pm. No final exams will be administered *earlier* than this date – please arrange end-of-semester travel plans accordingly.
A final exam review session will be held prior to the exam date; the exact date, time, and location will be announced later in the semester.

Grading

Assessments	Total Points	Percent Contribution
Hour Exam I (Sep 25)	100 pts	20%
Hour Exam II (Oct 23)	100 pts	20%
Hour Exam III (Dec 4)	100 pts	20%
Lecture Review Questions	75 pts	10% (based on 65 pts)
OWLv2 Mastery Problems	162 pts	10% (based on 140 pts)
Recitation Worksheets (10 pts each)	100 pts	10% (best 10 outcomes)
Final Exam	100 pts	10%

Students will retain all points earned for Lecture Review Questions and OWLv2 Mastery Problems, which may result in bonus points toward the final grade.

Tentative Grading Scale

Letter Grade	% Range
"A" (= A, A-)	88-100
"B" (= B+, B, B-)	74-88
"C" (= C+, C, C-)	60-74
"D" (= D+, D, D-)	48-60
"F"	0-48

+/- grading will be applied, but these specific ranges will be determined once all scores for the academic semester are entered.

Academic Support

Students who are struggling to succeed in CHEM 1780-2 or any of their courses are encouraged to take advantage of support available to them: office hours; help centers; Supplemental Instruction; and the [Academic Success Center](#). Students should work closely with their academic adviser to implement a plan for success.

The Department of Chemistry provides help to all general chemistry students in the **Martha E. Russell Chemistry Help Center** in 1761 Gilman Hall. It is open Monday-Thursday from 9am to 5pm and Friday from 9am to 1pm. The Help Center is staffed by general chemistry TAs. *All TAs for CHEM 1780 will hold their office hours only in this room* and any student in CHEM 1780-2 can obtain help from any of the CHEM 1780 TAs. General chemistry textbooks, solutions manuals, study guides, and workbooks are available for use; all resources in the Help Center may not be removed from the room. Students are encouraged to form study groups and meet on a regular basis.

Supplemental Instruction (SI) is offered to students in CHEM 1780. SI sessions are group study opportunities, scheduled three times per week. These sessions are facilitated by an SI Leader. Students should attend SI sessions to ask questions about course content and to develop learning/study strategies. Students who participate in SI sessions typically earn higher final course grades and exam grades than students who do not participate in SI. SI attendance is voluntary, and it is not a substitute for class attendance. For information about the days, times, and locations for SI sessions, see the Canvas course page.

Our Supplemental Instruction (SI) leader will introduce him/herself during the first week of lecture. This person will be available to answer questions in specified rooms around campus each week. The SI leader is not provided answer keys to the assessments.

Course Policies

Late Assignments and Deadline Extensions

The weekly lecture/topic Review Questions and OWLv2 Mastery Problems are designed to help you master a topic and keep you on task as the semester progresses. It is very important that you complete the work by the scheduled deadline.

- Late submissions of OWLv2 Mastery Problems are accepted on the OWLv2 platform with 10% penalty (see [Assessments](#)).
- Late submissions of weekly Lecture/Topic Review Questions are not accepted and will result in a score of zero for that week's assignment.

Therefore, please contact the instructor/head TA should you have had extraordinary circumstances that prevented you from completing the assignment **no later than 10:00 AM** the day after the deadline.

Deadlines are firm and communication is important. If you know you will be unable to complete an assignment because of illness or another emergency, contact the instructor/head TA in advance. If the illness or other emergency happens on the day the assignment is due, you must contact the instructor/head TA ASAP and by 10:00 AM the day after the deadline.

Expected In-Class and On-line Behaviors

- All communication within the course should adhere to university standards of [Netiquette at ISU](#). Specifically, communication should be scholarly, respectful, professional, and polite.
- You are expected to follow [ISU's Principles of Community](#).
- You are encouraged to disagree with other students, but such disagreements need to be based upon facts and documentation. It is the instructor's goal to promote an atmosphere of mutual respect during our interactions. Please contact the instructor or head TA if you have suggestions for improving the interactions in this course.
- Professional and respectful tone and civility are expected when communicating with fellow learners and the instructor at all times.
- Video interactions must reflect a respectful tone in verbal communications and body language.
- Use correct spelling and grammar in all written communications.

Expectations for On-Line Assignments

- You may work with others but completing assignments independently will enhance your learning.
- You may use the CHEM 1780-2 Canvas course content and your notes.

Expectations for Recitation Worksheets

- You may work with others, but each student must hand in his/her/their own worksheet at the end of the recitation period.

Expectations for all Examinations

- You must work independently.
- You will need a TI 30X IIS scientific calculator with basic functions including logarithms and exponential functions. *Programmable and graphing calculators are not allowed for exams.* NO calculators will be available on loan during any hour exam or the final exam.

Cheating and Plagiarism

Please review the information under [Academic Misconduct](#).

Scores

Weekly Lecture/Topic Review Questions and OWLv2 Mastery Problems are automatically graded either directly on Canvas or in the Cengage OWLv2 platform.

Recitation Worksheets will be graded by TAs and scores should be posted within 1 week of the due date.

Hour exams will be graded by TAs and scores should be posted within 24 hours of the exam date. The exams will be returned during the immediately following recitation period.

If you believe that an error has occurred, you must inform the instructor immediately, and by one week after the assignment/exam due date.

It is each student's responsibility to check his/her/their grades on Canvas regularly. If you detect any error or omission in scores, please contact the Instructor as soon as possible.

Final Grades

Final grades are based solely on graded work and are NOT negotiable. *No single student will be offered make-up assignments or extra credit points.* By completing all weekly Lecture/Topic Review Questions and OWLv2 Mastery Problems before their respective due dates, there are opportunities to earn bonus points.

Course Evaluations

Students will be asked to evaluate their TAs at mid-term by completing a questionnaire on Class Climate. At the end of the semester, similar course evaluations will be conducted, also including one for the instructor. Student comments become a part of personal files and are used for course improvement, so constructive comments are appreciated.

One point (3 pts maximum) will be added to the total points of Lecture Review Questions (see [Grading](#)) for filling out each evaluation.

Grading Policies regarding Incomplete Grades

See ISU online catalog: [Grading](#) / Policy Information / 3. Incomplete Marks

ISU Academic Calendar

<https://www.registrar.iastate.edu/calendar/>

Additional Learner-Centered Information

- Take time to familiarize yourself with the course structure and layout in the Canvas CHEM 178 site.
- Read all essential documents – course syllabus and course schedule.
- Identify and establish the communication channels provided – Help Forums and e-mail
- Confirm technical requirements – so that you can access all the materials
- Be patient and respectful of the response time indicated.
- Plan your time – have a personal schedule, establish and maintain a consistent study time, and stay organized. DO NOT WAIT UNTIL THE LAST MOMENT TO WORK ON ANY ASSIGNMENT.
- Make connections with fellow classmates, your TA, the Head TA, and the instructor.
- Ask questions whenever things are unclear or confusing.

Academic Misconduct

All acts of dishonesty in any work for this course constitute academic misconduct. Online courses are no exception. The [Student Code of Conduct](#) will be followed in the event of academic misconduct. Depending on the act, a student could receive an F grade on the test/assignment, an F grade for the course, or be suspended or expelled from the University. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing attempt to help another student commit an act of academic dishonesty. See more information at [Academic/Research Misconduct for Students](#). Academic dishonesty includes, but is not limited to each of the following acts when performed in any type of academic or academically related matter, exercise, or activity.

Plagiarism

Plagiarism is the act of representing directly or indirectly another person's work as your own. It can involve presenting someone's speech, wholly or partially, as your own; quoting without acknowledging the true source of the quoted material; copying and handing in another person's work with your name on it; and similar infractions. Even indirect quotations, paraphrasing, etc., can be considered plagiarism unless sources are properly cited. Plagiarism will not be tolerated, and students could receive an F grade on the test/assignment or an F grade for the course. The Iowa State University policy for academic misconduct can be found in the Student Disciplinary Regulations.

Obtaining Unauthorized Information

Information is obtained dishonestly, for example, by copying graded homework assignments from another student, by working with another student on a take-home test or homework when not specifically permitted to do so by the instructor, or by looking at your notes or other written work during an examination when not specifically permitted to do so.

Tendering of Information

Students may not give or sell their work to another person who plans to submit it as his or her own work. This includes giving their work to another student to be copied, giving someone answer(s) to exam question(s) during an exam, taking an exam and discussing its contents with students who will be taking the same exam, or giving or selling a term paper to another student.

Misrepresentation

Students misrepresent their work by handing in the work of someone else. The following are examples: purchasing a paper from a term paper service; reproducing another person's paper (even with modifications) and submitting it as their own; having another student do their computer program or having someone else take their exam.

Bribery

Offering money or any item or service to a faculty member or any other person to gain academic advantage for yourself or another is dishonest.

University Policies

Accommodations and Accessibility Statement

Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act and is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. *Reasonable accommodations are not retroactive* in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at <https://sas.dso.iastate.edu/>, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1060 Hixson Lied Student Success Center.

Religious Accommodation

If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the [Dean of Students Office](#) or the [Office of Equal Opportunity](#).

Harassment and Discrimination

Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, [Dean of Students Office](#) at 515-294-1020, or the [Office of Equal Opportunity](#) at 515-294-7612.

Free Expression

Iowa State University supports and upholds the First Amendment protection of [freedom of speech](#) and the principle of [academic freedom](#) in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

Contact Information for Academic Issues

If you are experiencing, or have experienced, a problem with any of the above statements, email academicissues@iastate.edu.

Public Health

If you are not feeling well, you should stay home and focus on your health. Should you miss the lecture or recitation due to illness, it is your responsibility to work with your instructor to arrange for accommodations and to make up coursework, as consistent with the instructor's attendance policy (see earlier sections of this syllabus).

You may choose to wear a face mask and/or receive the COVID-19 vaccine and boosters, as well as other vaccines such as influenza, but those options are not required. Thielen Student Health Center will continue to provide COVID-19 vaccinations free-of-charge to students. Other well-being resources for students are available at: <https://www.cyclonehealth.iastate.edu/wellbeing-resources/>.

Public health information for the campus community continues to be available on ISU's [Public Health Information](#) website.

Tentative Schedule of Topics / Meetings

Week	Date	Topics / Activity	Text Reading	Videos (Modules)
1	Aug 26	Introduction; Kinetics	Ch. 12.1	Module 1: V1-V2
	Aug 28	Kinetics	Ch. 12.2, 3	Module 1: V3-V4
	Aug 30	Recitation (Kinetics)		
2	Sep 2	Labor Day		
	Sep 4	Kinetics	Ch. 12.4, 6	Module 1: V5-V6
	Sep 6	Recitation (Kinetics)		
3	Sep 9	Kinetics	Ch. 12.5, 7	Module 1: V7-V8
	Sep 11	Equilibria	Ch. 13.1, 2, 4	Module 2: V1-V2
	Sep 13	Recitation (Kinetics; Equilibria)		
4	Sep 16	Equilibria	Ch. 13.2, 5	Module 2: V3-V4
	Sep 18	Equilibria	Ch. 13.5, 7	Module 2: V5-V6
	Sep 20	Recitation (Equilibria)		
5	Sep 23	Equilibria (I-C-E); Acids & Bases	Ch. 13.6; Ch. 14.1	Module 2: V7; Module 3: V1
	Sep 25	Hour Exam I (Kinetics, Equilibria)		
	Sep 27	Recitation (Exam I Review; Equilibria)		
6	Sep 30	Acids and Bases	Ch. 14.1-3, 6	Module 3: V1-V3
	Oct 2	Acids and Bases	Ch. 14.2, 6, 7	Module 3: V4-V6
	Oct 4	Recitation (Acids and Bases)		
7	Oct 7	Acids and Bases	Ch. 14.1-3, 6, 7; Ch. 15.5	Module 3: V4-V6; Module 4: V1
	Oct 9	Buffers	Ch. 15.1, 2	Module 4: V2
	Oct 11	Recitation (Acids and Bases; Buffers)		
8	Oct 14	Acids and Bases; Titrations	Ch. 14.4, 5, 8; Ch. 15.4	Module 3: V7; Module 4: V3
	Oct 16	Titration; Acids and Bases	Ch. 15.4; Ch. 14.9, 10	Module 4: V3; Module 3: V8
	Oct 18	Recitation (Acids and Bases, Titrations)		
9	Oct 21	Acids and Bases; Solubilities	Ch. 14.11; Ch. 16.1	Module 3: V9; Module 4: V5
	Oct 23	Hour Exam II (Equilibria, Acids and Bases, Aqueous Equilibria)		
	Oct 25	Recitation (Exam II Review; Acids and Bases; Solubilities)		
10	Oct 28	Electrochemistry	Ch. 4.9; Ch. 18.1	Module 5: V1, V3
	Oct 30	Electrochemistry	Ch. 18.1, 2	Module 5: V3-V4
	Nov 1	Recitation (Electrochemistry)		
11	Nov 4	Electrochemistry	Ch. 18.1, 2, 5, 7	Module 5: V5
	Nov 6	Electrochemistry	Ch. 18.7, 8	Module 5: V6
	Nov 8	Recitation (Electrochemistry)		
12	Nov 11	Thermodynamics	Ch. 17.1-3	Module 6: V1-V2
	Nov 13	Thermodynamics	Ch. 17.5, 6	Module 6: V3-V4
	Nov 15	Recitation (Thermodynamics)		
13	Nov 18	Thermodynamics	Ch. 17.4, 7	Module 6: V5-V6
	Nov 20	Thermodynamics	Ch. 17.8-10; 18.3	Module 6: V7-V8
	Nov 22	Recitation (Thermodynamics)		
	Nov 25-29	Thanksgiving Break		
14	Dec 2	Electrochemistry / Thermodynamics	Ch. 17, 18	
	Dec 4	Hour Exam III (Electrochemistry, Thermodynamics)		
	Dec 6	Recitation (Exam III Review, Thermodynamics)		
15	Dec 9	Nuclear Chemistry	Ch. 19.1, 3	Module 7: V1-V3
	Dec 11	Nuclear Chemistry; Course Summary	Ch. 19.1, 5	Module 7: V4
	Dec 13	Recitation (Nuclear Chemistry)		
	Dec 17	Final Exam (Comprehensive): Noon-2pm		