



# CHM2096: CHEMISTRY FOR ENGINEERS 2 SPRING 2025

CLASS #: 19820, 19826, 19827, 19828, 19829, 19830

## INSTRUCTOR INFORMATION

### INSTRUCTOR

Instructor	Email	Phone	Office Hours
Dr. Korolev Instructional Professor	Canvas email preferred korolev@ufl.edu	352-392-1087 (email preferred)	MWF 1:55pm-3:30pm in LEI400 and by appointment

### TEACHING ASSISTANTS

Teaching Assistants: TBA. You will meet your teaching assistant at your first discussion section. Teaching assistants will hold office hours on Mondays 5-7pm in the Chemistry Learning Center (CLC) in SFH 105. You can get help from any of the CHM2045/CHM2046/CHM2095 teaching assistants in the CLC who offer additional office hours.

## GENERAL INFORMATION

### COURSE DELIVERY/MEETING TIMES

Lectures will be held in FLI 50 from 12:50pm to 1:40pm on Mondays, Wednesdays, and Fridays. Discussion sections will be held in person on Thursdays at the time listed on your schedule. Exams will be held on campus in the evening assembly periods, E2-E3, on the dates listed in the course schedule in the syllabus.

### REQUISITES

Please refer to the [Undergraduate Catalog](#) for placement and prerequisite information.

### COURSE DESCRIPTION AND GOALS

CHM2095 constitutes the first semester of the two-term sequence of Chemistry for Engineers I & II, CHM2095/2095L - CHM2096/2096L. Topics include stoichiometry, energy and thermodynamics, atomic and molecular structure, the states of matter, reaction rates and introduces chemical equilibria. All topics are taught in an engineering case-study context. (P)

By the end of this course, students will be able to describe and apply the scientific method, and describe and apply skills to solving problems including those involving multi-step mathematical sequences. Students will acquire knowledge generally of the field of chemistry, and will be able to connect this knowledge to principles that govern the natural world.

Specifically, students will be able to:

1. Clearly communicate in writing information derived from course related readings/lectures about the major concepts and themes in the chemical sciences.
2. Apply knowledge of the fundamental principles of chemical, acid/base and aqueous equilibria to perform related calculations and make predictions of system behavior.
3. Describe and apply the fundamental principles of kinetics, thermodynamics, and electrochemistry.
4. Describe the properties of complex ions and coordination compounds.
5. Analyze chemical principles in engineering applications and identify the importance of elements in nature and industry.
6. Apply general chemistry knowledge to solve engineering problems

## GENERAL EDUCATION OBJECTIVES AND LEARNING OUTCOMES

Primary General Education Designation: Physical Sciences (P) ([area objectives available here](#)). A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

In General Chemistry I, these objectives will be met as detailed below. At the end of this course, students will be expected to have achieved the following learning outcomes in content, communication, and critical thinking: The course objectives align with the UF General Education student learning outcomes and physical science area learning outcomes:

General Education SLO	Physical Science SLO	Course Objective Alignment	Assessment
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.	Objectives 1-5	All assessments offer opportunities for students to demonstrate content knowledge.
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes.	Objectives 1-5	All assessments offer opportunities for students to demonstrate critical thinking skills.
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Objective 6	Mini-project assignments

## STUDENT LEARNING OUTCOMES

A complete list of student learning outcomes is posted in Canvas, organized by chapter.

## REQUIRED & RECOMMENDED COURSE MATERIALS

### ONLINE HOMEWORK, E-BOOK (REQUIRED, MUST PURCHASE)

We will be using the Achieve Essentials for General Chemistry online homework system for regular homework this semester. Achieve is an online homework platform and is required for this course. Instructions on correctly registering for Achieve will be available on the Canvas course site once the semester has started. The Achieve homework platform also comes with the OpenStax E-book that can be used for reference.

There are two options for purchasing access to homework: Option 1: consent to have the purchase price charged via UF AllAccess to your student account following the directions posted on the course homepage in Canvas (this is the lowest price); this is a time-limited option after which only Option 2 is available. Option 2: purchase an access code for the materials at the UF Bookstore (at a slightly higher price).

To opt in to UF All Access, navigate to: <https://bsd.ufl.edu/allaccess>. Click the “Opt In” tab or view the “View Eligible UF All Access Classes” button. You will be prompted to log in using Gatorlink credentials. Follow the prompt to authorize charges to your student account. The access code will then be provided.

### TEXTBOOK (REQUIRED, NO CHARGE)

The textbook we will be using is OpenStax which is a free Open Educational Resource (OER). The text can be accessed through the Achieve homework platform, via a PDF which is posted on the Canvas course page, or online at: <https://openstax.org/details/books/chemistry-2e>. Students are welcome to use other textbooks as reference materials, such as the ones on reserve at Marston Science Library.

### CALCULATOR (REQUIRED, MUST PURCHASE)

You will require a non-graphing, non-programmable scientific calculator capable of logarithmic functions.

### IClicker (REQUIRED, NO CHARGE)

You will use iClicker to answer in-class clicker questions. Access is provided free of charge to students. An access code will be sent in the first week of the semester to all students via email. You will use your own device (phone, tablet, or laptop) during class to answer clicker questions with iClicker. iClicker may be used to monitor attendance in the classroom.

### COURSE FEES

This course has an additional fee of \$1.03.

## COURSE COMMUNICATIONS

### GENERAL OR ACADEMIC QUESTIONS

General course questions and all academic inquiries should be posed to your instructor during office hours, or to TAs during their office hours or during discussion sessions. Please be prepared before coming to office hours. Emails are for administrative purposes only, and not for distance-instruction.

### PRIVATE OR GRADE-RELATED QUESTIONS

Direct private or grade-related to your instructor via the mail function in Canvas. Do not email outside of Canvas to your instructor's external email address – we aren't permitted to discuss grade related questions outside of Canvas. You will be asked to resend the query through Canvas. Instructor response time to email

queries is <48 h during the workweek, or the first business day for emails received Friday or over the weekend. Grades will not be discussed during office hours due to FERPA regulations.

## NETIQUETTE

All members of the class are expected to follow rules of common courtesy in all email messages, discussions, and chats. Please be mindful of your comments and responses, and make sure that they are respectful and inclusive to all participants.

## TENTATIVE SCHEDULE

The lecture schedule is tentative, but exam dates will not change. A detailed schedule is on pages 10-12.

Dates	Topics/Chapters	Quizzes/Exams
Jan 13 – Jan 17	Ch 12: Intro and Kinetics	MUST Test
Jan 20 – Jan 24	Holiday 1/20; Ch 13: Equilibrium	
Jan 27 – Jan 31	Ch 13: Equilibrium, Ch 14: Acid-Base Equilibria	Ch 13 Quiz
Feb 3 – Feb 7	Ch 14: Acid-Base Equilibria	
Feb 10 – Feb 14	Ch 14: Buffers & Titrations	<b>Exam 1: Wed, Feb 12</b>
Feb 17 – Feb 21	Ch 15: Ionic Equilibria	
Feb 24 – Feb 28	Ch 15: Ionic Equilibria; Ch 16: Thermodynamics	Ch 15 Quiz
Mar 3 – Mar 7	Ch 16: Thermodynamics; Ch 17: Electrochemistry	
Mar 10 – Mar 14	Ch 17: Electrochemistry	<b>Exam 2: Mon, Mar 10</b>
Mar 17 – Mar 21	Spring Break	
Mar 24 – Mar 28	Ch 17: Electrochemistry	
Mar 31 – Apr 4	Ch 18: Representative Metals, Metalloids, and Nonmetals	Ch 17 Quiz
Apr 7 – Apr 11	Ch 19: Transition Metals and Coordination Chemistry	<b>Exam 3: Thurs, Apr 10</b>
Apr 14 – Apr 18	Ch 21: Nuclear Chemistry	
Apr 21 – Apr 25	Ch 20: Organic Chemistry	Ch 21 Quiz
Apr 28 – May 2	Final Exam Week	<b>Final: Mon, Apr 28</b>

## COURSE POLICIES

### ASSIGNMENT DUE DATES

All due dates for assignments are clearly posted in the course assignments of the Canvas page and reflect the most up-to-date information. All assignments must be completed by the stated due date and time for credit. A Dean of Students note verifying documentation of illness or personal matter must be provided for at least five of the seven days of the week of the assignments' deadline for accommodations to be considered.

## PRE-LECTURE ASSIGNMENTS

You are expected to complete pre-lecture assignments in preparation for each class day. These assignments are based on the reading in the recommended textbook and provided videos. Each assignment has problems that match the content for you to master the content before class. These assignments will be posted on Canvas under the quizzes tab and are due prior to class. You will have multiple attempts to successfully answer the pre-lecture assignments. Three of these assignment grades are dropped from your overall course grade. Estimated time to complete pre-class work is approximately 20 minutes for each lecture.

## ENGINEERING MINI-PROJECTS

Part of your grade will be determined by completion of engineering mini-projects during your discussion sections. There will be three projects spread over the semester that will relate to material covered in lecture. Each project will be completed over three weeks to be done both during discussions and outside the discussions. You will be graded on the scientific merit of your work in groups. More of the details of the activities will be discussed during the first class meeting on August 31<sup>st</sup> (discussions do not meet during add/drop on August 24<sup>th</sup>). Your attendance is required in your registrar assigned section. If you have an unexcused absence during the discussion period for a given week, then you will score a 0 on the assignment for that week. Estimated time to complete engineering mini-projects is 1 hour a week.

## ENGINEERING ASSIGNMENT

2% percent of your course grade will be based on the final engineering assignment due toward the end of the semester. This is a written assignment that asks you to highlight a general chemistry topic that is applied in the field of engineering that you are interested in. You will describe the chemical process in detail, including its application, and include sources of information. More details will be provided during the semester.

## ACHIEVE HOMEWORK ASSIGNMENTS

Online homework assignments through Achieve are due three times per week, typically 2-3 days after lecture. You have multiple attempts at each homework assignment, with the highest score counting for credit. Three homework assignment scores are dropped from your overall course grade. You can access homework via the Canvas course under Modules. There are also some introductory assignments on Achieve that contribute to your grade. Estimated time to complete homework assignments is approximately 1 hour per assignment.

## IClicker

iClicker is a classroom response system used for in-class participation during lectures. The in-class questions will be presented during class in-pace with the lecture. You can earn points in class by correctly answering clicker questions through iClicker. iClicker points will begin counting after add/drop is over, on August 30<sup>th</sup>. The lowest three clicker grades will be dropped at the end of the semester.

## QUIZZES

There will be periodic quizzes administered online via Canvas to prepare you for the exams, approximately once per week as listed on the schedule. Quizzes should be taken seriously and are to be completed individually. Quizzes are timed for 1 hour each and must be submitted by the posted deadline to count for credit. The lowest quiz grade will be dropped at the end of the semester.

## CANVAS HOMEWORK & WORKSHEETS

Several optional homework assignments are available for each chapter to help you understand the material. The optional homework is posted in Canvas. You have multiple attempts to successfully answer the questions. These are not worth any points. There are also worksheets posted that contain old exam problems.

## EXAMS

Progress exams occur in the evenings, periods E2-E3, in exam rooms TBA. Exam dates are provided in the schedule in this syllabus document. The final exam is scheduled during the final exams period as assigned by the registrar. You are permitted use of a non-graphing non-programmable scientific calculator. Notes, cell phones or other electronic devices are not permitted. Scantrons and blank paper are provided.

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## PROGRESS EXAM “AVERAGE/REPLACE” POLICY

This applies to all students. No progress exam score will be dropped for any reason. To alleviate the stress of potential issues that do not fall under officially sanctioned absences, we have incorporated an “average/replace” policy: the lowest of the three progress exams will be replaced by the average of the three progress exams. This policy helps to minimize the impact of a single poor performance (it will not disappear, but will be minimized). For example, if a student scores the following on their three progress exams: 0%, 65%, 80%, then the 0% would be replaced with the average of 48%. That is a much better score than a 0.

Bubbling errors will not be negotiated. A 5 point penalty will be applied for failure to bubble in a UFID correctly or not taking the exam in the assigned room. A 30 point penalty will be applied for failure to bubble in a form code or the wrong form code or for using a writing implement that cannot be scanned (e.g. a pen).

## POSTED GRADE DISPUTES

Should a student wish to dispute any grade received in this class, the dispute must be in writing (via Canvas e-mail to *your* instructor) and submitted within one week of the grade being posted to Canvas. After one week has passed from when the grade was posted and the student made aware of the posting of the grade(s) to Canvas, the instructor considers those grades final.

## ATTENDANCE, EXTENSION REQUESTS

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Exam absences will be handled in accordance with official UF academic regulations. For more information, see <https://catalog.ufl.edu/UGRD/academic-regulations/> . See below for further clarification for two different types of situations.

(1) Conflicts with other events: acceptable reasons may include religious holidays, military obligations, special curricular requirements (e.g., attending professional conferences), or participation in official UF-sanctioned activities such as athletic competitions, etc. For more information on such absences see the official UF Policy at <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#absencestext> ). If you must be absent for an exam due to a documented and approved conflict known in advance, you must e-mail your instructor (within Canvas) the documentation at least one week prior to the scheduled exam and an early conflict exam will be scheduled for you.

(2) Missing an exam due to an emergency or sudden illness: If you are absent for an exam due to an unpredicted documented medical reason or family emergency, you must contact the instructor as soon as possible, and you may be asked to have your excuse verified by the Dean of Students Office (DSO). Your instructor will follow UF academic regulations in evaluating the notification and/or documentation received from you or from the DSO on your behalf. Once your instructor is satisfied with the validity of your exam

absence a make-up exam will be scheduled after a reasonable amount of time, i.e., before the end of the semester. If your documentation is deemed insufficient to excuse your absence you will receive a zero on the missed exam.

Exams taken at any other time than the regularly scheduled exam time have different questions that assess the same material at a comparable level of difficulty. Students are not able to review these exams until after the semester has concluded.

## WORKLOAD

As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work per week outside of class for every contact hour. This is at least 6 hours a week for our 3 credit course. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, seeking help from the instructor in office hours, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.

Assigned individual work includes: online homework (3 hours a week), pre-class preparation (1 hour a week), mini-projects (1 hour a week), and quizzes (1 hour a week). In addition to the graded assignments, it is recommended that you utilize the optional homework, worksheets, and practice exams on Canvas to gain more practice. Some students will require more than 6 hours a week of work outside of class in order to master the material.

## GRADING

### GRADE POLICY

There is no extra credit available for this course. Exam grades or course grades are not curved. Current UF grading policies for assigning grade points can be found in [the catalog](#). Assignments weights are as follows:

Assignment Group	Weight %
Progress Exams	60%
Final Cumulative Exam	20%
Homework Assignments	5%
Pre-Lecture Assignments	2%
iClicker	2%
Quizzes	2%
Engineering Mini-Projects	7%
Engineering Assignment	2%
TOTAL	100%

Grade scale (note: there is no rounding to your score in Canvas):

Letter	A	A-	B+	B	B-	C+	C	D+	D	D-	E
Cutoff	90.0	86.0	83.0	80.0	77.0	73.0	69.0	66.0	63.0	60.0	< 60.0



## UNIVERSITY POLICIES

### STUDENTS REQUIRING ACCOMMODATIONS

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (DRC) by visiting [disability.ufl.edu/students/get-started](http://disability.ufl.edu/students/get-started). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations. Students should send their accommodations via the DRC portal to [korolev@ufl.edu](mailto:korolev@ufl.edu)

### UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida. The following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.”

### IN-CLASS RECORDING

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.



## CAMPUS RESOURCES

U Matter, We Care: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the [Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center website](#).

University Police Department: Visit [UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the [UF Health Emergency Room and Trauma Center website](#).

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

## ACADEMIC RESOURCES

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

[Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

[Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.

[Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

[Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the [Student Honor Code and Student Conduct Code webpage](#) for more information.

On-Line Students Complaints: View the [Distance Learning Student Complaint Process](#).

## FEEDBACK

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## GETTING HELP

For issues with or technical difficulties with Canvas, contact the UF Help Desk: (352)-392-HELP.

## INCLUSIVE LEARNING ENVIRONMENT

We embrace the University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinion or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act." We are committed to fostering an open and inclusive classroom and laboratory environment in our College, where every student, guest instructor and contributor feels valued. If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see your instructor or refer to the Office on Multicultural & Diversity Affairs Website: <http://www.multicultural.ufl.edu/>

## DISCLAIMER

This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes will be communicated clearly.

## DETAILED COURSE SCHEDULE (SUBJECT TO CHANGE)

The following lecture schedule is tentative, but exam dates will not change. Page numbers correspond to the downloaded OpenStax PDF that is available on the Canvas course site.

Dates	Agenda/Topics	OpenStax Pg #	Assignments Due
Mon, Jan 13	Class 1: Intro and Kinetics review	Ch. 12.1-4, 599-624	PLA 1 (ungraded)
Wed, Jan 15	Class 2: Collision Theory	Ch. 12.5, 625-629	PLA 2 (ungraded)
Thur, Jan 16	MUST; Intro to Mini-projects		
Fri, Jan 17	Class 3: Mechanisms and Catalysis	Ch. 12.6-7, 630-641	PLA 3 (ungraded)
Mon, Jan 20	MLK Holiday – No Class		
Wed, Jan 22	Class 4: Chemical Equilibrium	Ch. 13.1, 657-659	PLA 4, HW 1, HW 2
Thurs, Jan 23	Mini-project 1 inquiry phase		
Fri, Jan 24	Class 5: Equilibrium Constants	Ch. 13.2, 660-668	PLA 5, HW 3, HW 4
Mon, Jan 27	Class 6: Equilibrium Calculations	Ch. 13.4, 675-682	PLA 6, HW 5
Wed, Jan 29	Class 7: Le Chatelier Principle	Ch. 13.3, 669-674	PLA 7, HW 6
Thurs, Feb 1	Mini-project 1 problem-solving		Quiz 1
Fri, Jan 31	Class 8: Acids, Bases, and pH scale	Ch. 14.1-2, 160-168	PLA 8, HW 7
Mon, Feb 3	Class 9: Relative Strength of Acids	Ch. 14.3, 714-716	PLA 9, HW 8
Wed, Feb 5	Class 10: Weak and Polyprotic Acids	Ch. 14.3, 702-714	PLA 10, HW 9
Thurs, Feb 6	Mini-project 1 reporting		
Fri, Feb 7	Class 11: Hydrolysis of Salts	Ch. 14.4, 716-720	PLA 11, HW 10

Mon, Feb 10	Class 12: Lewis Acids & Bases	Ch. 15.2, 763-765	PLA 12, HW 11
Wed, Feb 12	Class 13: Buffers, Indicators	Ch. 14.6, 724-729	PLA 13, HW 12, Exam 1
Thurs, Feb 13	Mini-project 2 inquiry		
Fri, Feb 14	Class 14: Buffer Capacity & pH change	Ch. 14.6, 724-729	PLA 14, HW 13
Mon, Feb 17	Class 15: Acid-Base Titrations	Ch 14.7, 730-737	PLA 15, HW 14
Wed, Feb 19	Class 16: Dissolution of Ionic Salts	Ch. 15.1, 749-762	PLA 16, HW 15
Thurs, Oct 3	Mini-project 2 problem solving		
Fri, Feb 21	Class 17: Precipitation of Ionic Salts	Ch. 15.1, 749-762	PLA 17, HW 16
Mon, Feb 24	Class 18: Complex Ion Equilibria	Ch. 15.3, 767-771	PLA 18, HW 17
Wed, Feb 26	Class 19: Entropy	Ch. 16.1, 783-786	PLA 19, HW 18
Thurs, Feb 27	Mini-project 2 reporting		Quiz 2
Fri, Feb 28	Class 20: Spontaneity	Ch. 16.2, 787-792	PLA 20, HW 19
Mon, Mar 3	Class 21: Laws of Thermo	Ch. 16.3, 793-796	PLA 21, HW 20
Wed, Mar 5	Class 22: Free Energy	Ch. 16.4, 797-808	PLA 22, HW 21
Thurs, Mar 6	Mini-project 3 inquiry		
Fri, Mar 7	Class 23: Redox Reactions	Ch. 17.1, 818-820	PLA 23, HW 22
Mon, Mar 10	Class 24: Galvanic Cells & Batteries	Ch. 17.2, 821-823	PLA 24, HW 23, Exam 2
Wed, Mar 12	Class 25: Cell Potentials	Ch. 10.2, 412-422	PLA 25, HW 24
Thurs, Mar 13	Mini-project 3 problem-solving		
Fri, Mar 14	Class 26: Strength and Corrosion	Ch. 17.6, 840-842	PLA 26, HW 25
Mon, Mar 24	Class 27: Potential & Concentration	Ch. 17.4, 830-834	PLA 27, HW 26
Wed, Mar 26	Class 28: Current & Electrolysis	Ch. 17.7, 843-846	PLA 28, HW 27
Thurs, Mar 27	Mini-project 3 reporting		
Fri, Mar 28	Class 29: Electrolytic Cells	Ch. 17.7, 846-848	PLA 29, HW 28
Mon, Mar 31	Class 30: Periodicity and Metals	Ch. 18.1-2, 858-869	PLA 30, HW 29
Wed, Apr 2	Class 31: Nonmetals and Metalloids	Ch. 18.3-4, 870-884	PLA 31, HW 30
Thurs, Apr 3	Prep for Presentations		Quiz 3
Fri, Apr 4	Class 32: Preparation of Metals	Ch. 19.1, 935-947	PLA 32, HW 31

Mon, Apr 7	Class 33: Coordination Compounds	Ch. 19.2, 948-955	PLA 33, HW 32
Wed, Apr 9	Class 34: Coordination Compounds	Ch. 19.2, 955-961	PLA 34, HW 33
Thurs, Apr 10	Flex Day		Exam 3
Fri, Apr 11	Class 35: Crystal Field Theory	Ch. 19.3, 962-970	PLA 35, HW 34
Mon, Apr 14	Class 36: Nuclear Decay	Ch. 21.2, 1028-1030	PLA 36, HW 35
Wed, Apr 16	Class 37: Nuclide Stability	Ch. 21.1, 1022-1027	PLA 37, HW 36
Thurs, Apr 17	Presentations		
Fri, Apr 18	Class 38: Rate and Radioactivity	Ch. 21.3, 1031-1041	PLA 38, HW 37
Mon, Apr 21	Class 39: Fission and Fusion	Ch. 21.4, 1042-1054	PLA 39, HW 38
Wed, Apr 23	Class 40: Organic Structures	Ch. 20.1, 978-990	Quiz 4
<b>Sat, Dec 7</b>	<b>Final Exam (10:00am-12:00pm)</b>	<b>Cumulative</b>	

## SAMPLE GRADING RUBRICS

The following are examples of the rubrics used for the three phases of the engineering mini-projects.

Mini-project inquiry phase:

Criteria	Points
The flow diagram is consistent with the summary of the process	2
All physical and moving components are correctly identified and connected in the flow diagram	2
The flow diagram is professional and is appropriately scaled for the scope of the problem	2
Relevant formulas and equations are identified	2
Relevant information is found and sources are included	2

Mini-project problem solving phase:

Criteria	Points
The motivation for the calculations is identified	2
The calculations include all necessary steps and are presented in an organized manner	2
The calculations are solved correctly based on the given data	2
Key findings are identified for all parts	2
Assumptions are concisely described and justified	2

Mini-project reporting phase:

Criteria	Points
The specific purpose of the project is identified	2
The steps taken to address the project and the key findings are clearly stated	2
The impacts and implications are addressed sufficiently in any applicable contexts	2
The comparisons fit the key findings and impacts of the results; The recommendations provide clear guidance for action and are justified.	2
The report is well-written, organized, and is free of writing errors	2