



CHEM 1312 | Fundamentals of Chemistry 2

Section: 20207 | Face-to-Face

Prerequisite(s): MATH 2312 or equivalent and CHEM 1311. For science and engineering majors. May not be applied toward a degree until CHEM 1112 is successfully completed. Credit may not be applied to a degree for both CHEM 1312 and CHEM 1305. General principles, fundamental laws, equilibrium, kinetics, electrochemistry, and elementary inorganic, nuclear, and organic chemistry.

Instructor Information

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Office Hours

to be announce on Canvas

General Course Information

Course Meeting Time: MoWe 1:00 - 2:30PM

Course Meeting Location: KH 202

Course Objectives and Student Learning Outcomes

PREREQUISITES

MATH 2312 (Precalculus) or equivalent and successful completion of CHEM 1311 (formerly 1331). For science and engineering majors, this course cannot be applied to a degree until CHEM 1112 (Fundamentals of Chem. Lab) is successfully completed. In addition, credit cannot be applied to a degree for more than one of the following courses: CHEM 1305, CHEM 1312, CHEM 1322, CHEM 1372, or CHEM 1412.

COURSE TOPICS

Intermolecular forces, solution composition, colligative properties, kinetics, chemical equilibrium; acid- and bases; entropy; free energy; oxidation-reduction chemistry; electrochemistry; nuclear chemistry; i.e., textbook chapters: 10-18.

LEARNING OUTCOMES

Students who complete this course will be able to:

- Analyze solution behavior using composition, intermolecular forces, and thermodynamic relationships.
- Determine reaction rates and evaluate mechanisms using rate laws and integrated rate equations.
- Apply equilibrium relationships to analyze chemical systems and predict responses to changing conditions.
- Solve quantitative acid–base problems including buffers and titrations.
- Apply solubility equilibria relationships to predict precipitation and dissolution behavior.
- Analyze thermodynamic processes using entropy, enthalpy, and Gibbs free energy relationships.
- Analyze electrochemical systems and relate redox behavior to energy and equilibrium relationships.
- Analyze nuclear processes using decay laws, stability trends, and mass–energy relationships.

Equation & Unit Expectations

Success in this course requires the ability to recall and correctly apply key equations and relationships without reliance on a formula sheet. Physical constants will be provided on the Periodic Table Page of the exams/assignments; however, students are expected to understand and use equation structures, proportional relationships, and SI unit relationships (including prefixes and derived units) by memory.

Texas Core Fulfilled:

CHEM 1312 is a University of Houston–approved Core Curriculum course in the Life and Physical Sciences category. Courses in this category focus on describing, explaining, and predicting natural phenomena through the application of the scientific method. Emphasis is placed on understanding interactions among natural systems and on the role of scientific principles in the physical world and in human experiences.

Core Objectives:

- Critical Thinking: Identify, analyze, and synthesize information and data to solve chemistry-related problems.
- Communication: Develop and clearly express chemical ideas through written, oral, and visual forms.
- Teamwork: Work effectively with others to identify, analyze, and solve chemistry problems.
- Empirical and Quantitative Skills: Select and apply appropriate models and quantitative methods to analyze and solve chemistry-related problems accurately.

Delivery of Instruction

How This Course Works

This course is structured to support steady progress, timely feedback, and fair evaluation for all students. Assignments, quizzes, and exams follow consistent scheduling patterns so that expectations are predictable and students can plan effectively. While support and resources are readily available, course policies are applied uniformly to maintain clarity, equity, and academic standards. Successful students typically engage early, ask questions, and consistently use available resources as part of their regular study practices.

Lectures

Face-to-face lecture sessions will be held on campus as scheduled for each section. Cell phones and other devices must be turned off or silenced during lectures. At the instructor's sole discretion, lecture sessions may be recorded and made available through the course website.

Attendance

Regular attendance is expected. Students are responsible for engaging with course material and announcements posted on Canvas. Students whose absences become excessive may be required to drop the course in accordance with the University of Houston attendance policies: <https://publications.uh.edu/content.php?catoid=56&navoid=21130>

Proctored exams will be administered using computer workstations in one of the on-campus Computer Testing Centers (i.e., CASA or Dart Center).

Digital Content

The Canvas learning management system (Canvas welcome page at canvas.uh.edu) and other software accessible through the University of Houston will distribute digital course content. You must know your Cougar ID and password to use these systems. Students are responsible for course announcements and other information posted on Canvas, so please check Canvas daily. In addition, graded homework assignments, quizzes, and exams will be posted on Canvas and submitted using the Cengage WebAssign homework system.

Required Instructional Materials

Textbook

Digital access to Zumdahl, Zumdahl, and DeCoste "Chemistry, An Atoms First Approach," 3rd Edition, Cengage Learning, 2021 (ISBN: 9798214612058) and the WebAssign homework system (ISBN: 9781337827577) is provided through Canvas as part of the University of Houston Cougar Textbook Access Program (CTAP). Students who register for this class automatically opt into the CTAP program. For participants, a

CTAP student fee bill will be charged to cover the cost of digital access. If you have alternate access to the textbook and the required WebAssign system, you may opt out of the CTAP program before Wednesday, 09/09/2026. The opt-out instructions are on the following website: CTAP Flat Fee FAQs - <https://uh.edu/af-auxiliary-services/ctap/ctap-flat-fee-faqs/>. You may opt back in the same way you opted out: access your student account and click the "Student Financials" tab. Scroll to the bottom of the page, click "CTAP Opt-Out," and then click "opt-in."

(Note: Students who have subscribed to Cengage Unlimited should opt out and use access to materials through their subscription.)

Calculator

Students must bring a working, non-graphing scientific calculator to each exam. Graphing calculators, calculators with alphanumeric storage capabilities, cell phones, and smart devices are prohibited. A browser-based calculator is also available for use on homework assignments and exams.

Computer and the Internet

The following minimum technical requirements for a computer and the internet are needed for this course:

- Windows 11 (Pro recommended) or macOS 13.x (Ventura) or later.
- Reliable broadband internet connection (>1.5 Mbps).
- A recent desktop/laptop browser version like Firefox, Chrome, Edge, or Safari. You may use the following link to check your browser settings: <https://ng.cengage.com/static/browsercheck>.
- Access to a webcam is required (if needed). This provides flexibility if temporary modifications of course delivery are necessary due to public health or weather emergencies.
- Teams and other Microsoft software are available to students at the UH download site: <https://uofh.sharepoint.com/sites/Software>.

Course Schedule, Assignments, and Assessments

Anticipated Schedule

Special Dates

First day of classes (August 24, 2026, Monday); last day to drop without a grade (September 9, 2026, Wednesday); last day to drop for any reason with a “W” (November 18, 2026, Wednesday); the last day of classes before finals (December 5, 2026, Saturday). Final exam period (December 8-14, Tuesday - Monday). Link to full academic calendar: <http://www.uh.edu/academic-calendar-undergraduate>

Lecture Schedule and Preparation

The lecture schedule outlines the anticipated progression of topics throughout the semester. Students are expected to prepare for each week based on the listed textbook sections and to stay current with the course material. Minor adjustments to pacing may occur as needed, and any changes will be communicated through Canvas.

Table 1. Anticipated Lecture Timeline (Fall 2026)

Week	Starting	Sections	Topic	Exam Unit
1	Aug 24	10.1–10.3	Course Introduction: Properties of Solutions	1
	Aug 31	—	Labor Day Holiday (Sept. 7, Monday)	
2	Aug 31	10.4–11.2	Properties of Solutions and Chemical Kinetics	1
3	Sept 7	11.2–11.4	Chemical Kinetics	1
4	Sept 14**	11.5–12.2	Chemical Kinetics and Chemical Equilibrium	1
5	Sept 21	12.3–12.7	Chemical Equilibrium	1
		Ch. 10–12	Exam 1: Sept. 28–Oct. 1	1
6	Sept 28	13.1–13.7	Acids and Bases	2
7	Oct 5	13.8–14.2	Acids and Bases and Acid-Base Equilibria	2
8	Oct 12**	14.3–14.5	Acid-Base Equilibria	2
9	Oct 19	15.1–15.2	Solubility Equilibria	2
		Ch. 13–15.2	Exam 2: Oct. 26–28	2
10	Oct 26	16.1–16.9	Spontaneity, Entropy, and Free Energy	3
11	Nov 2	17.1–17.4	Electrochemistry	3
12	Nov 9	17.5–17.9	Electrochemistry	3
13	Nov 16**	18.1–18.4	The Nucleus, A Chemist's View	3
13+	Nov 23**	—	Class meetings early in the week; Thanksgiving Holiday (Nov. 25–29)	3
		Ch. 16–18.4	Exam 3: Nov. 30–Dec. 2	3
14	Nov 30	18.5–18.7	The Nucleus, A Chemist's View (continued)	Final
		Ch. 10–18	Final Exam (Cumulative): Dec. 8–11	Final

****Reserve a specific time at least two weeks in advance at <https://ccs.casa.uh.edu/> or the Student Accessibility Center - University of Houston.**

Any scheduling modifications necessary due to weather or other events will be announced on Canvas.

COURSE ASSIGNMENTS

Practice materials

Students must study the textbook and work through the practice examples to gain knowledge and develop skills. Practice exercises, quizzes, and exams will be available through Canvas. Other practice and explanatory materials are given solely at the discretion of your instructor.

Homework and Quizzes: Expectations

Homework and quizzes are designed to reinforce lecture material and promote regular engagement with course concepts. Fourteen homework assignments and fourteen quizzes will be completed during the semester. All homework and quizzes must be submitted through the designated platform by the posted deadlines.

Missed homework or quizzes receive a score of zero, including in cases of excused absence. To provide limited flexibility for occasional difficulties or absences, the two lowest homework scores and the two lowest quiz scores are dropped when calculating final averages.

Homework and Quizzes

Fourteen graded homework (HW) assignments and Fourteen Quizzes (QZ) will be completed covering course topics. The due dates and closing times are summarized in the Assignments section of Canvas and displayed on the Canvas Calendar. Questions on homework assignments generally use a "Mastery Style" of delivery, in which a set of questions is provided, and a specified number must be answered correctly to earn credit. Four attempts are provided for each question set. Questions on the quiz assignments are similar, but only two attempts are allowed for each question set. To promote time

awareness in preparation for the exam, each quiz must be completed within a 120-minute time limit (about four times as much time per question as is provided on exams).

Performance on the initial Review Homework and Quiz provides an early indicator of preparedness for this course. Students earning less than 75% are strongly encouraged to consult with the instructor or an academic advisor to discuss next steps, including whether continued enrollment is advisable.

The anticipated schedule for lecture topics, homework, quizzes, and exams. Any changes to homework and quiz dates are automatically summarized in the Canvas Assignment and WebAssign Assignment sections.

All assignments are due at 11:59 PM local time.

Table 2: Homework and Quiz Schedule

Assignment	Due Date	Content Covered	Exam Unit
HW 1 & Quiz 1	Aug. 30 (Sun.)	Review of CHEM 1311 prerequisite material	
HW 2 & Quiz 2	Sept. 6 (Sun.)	Chapter 10: Intermolecular Forces	1
HW 3 & Quiz 3	Sept. 13 (Sun.)	Chapter 11: Chemical Kinetics (11.1–11.4)	1
HW 4 & Quiz 4	Sept. 20 (Sun.)	Chapter 11: Chemical Kinetics (11.4–11.7)	1
HW 5 & Quiz 5	Sept. 27 (Sun.)	Chapter 12: Chemical Equilibrium	1
HW 6 & Quiz 6	Oct. 4 (Sun.)	Chapter 13: Acids and Bases	2
HW 7 & Quiz 7	Oct. 11 (Sun.)	Chapters 13–14: Acid–Base Equilibria	2
HW 8 & Quiz 8	Oct. 18 (Sun.)	Chapter 14: Acid–Base Equilibria	2
HW 9 & Quiz 9	Oct. 25 (Sun.)	Chapter 15: Solubility and Complex Ions	2
HW 10 & Quiz 10	Nov. 1 (Sun.)	Chapter 16: Thermodynamics	3
HW 11 & Quiz 11	Nov. 8 (Sun.)	Chapter 17: Electrochemistry	3
HW 12 & Quiz 12	Nov. 15 (Sun.)	Chapter 17: Electrochemistry (continued)	3
HW 13 & Quiz 13	Nov. 22 (Sun.)	Chapter 18: Nuclear Chemistry (18.1–18.4)	3

Assignment	Due Date	Content Covered	Exam Unit
HW 14 & Quiz 14	Dec. 6 (Sun.)	Chapter 18: Nuclear Chemistry (18.5–18.7)	Final

Students are responsible for managing their submissions and accounting for potential technical issues. Neither the Department of Chemistry nor the instructor can adjust deadlines due to individual technical difficulties, such as sporadic Canvas outages or connectivity issues.

If you experience ongoing technical issues, assistance from the Canvas Support Hotline is available at 855-597-3394 or via the help pages at <https://uh.edu/canvas/help>.

Course materials, including lecture notes, homework, quizzes, and exams, are copyrighted and may not be posted or distributed on external websites (e.g., Chegg, Course Hero, GroupMe). Compliance with this policy is enforceable under course, NSM, and University of Houston Academic Honesty policies.

Core activities

The instructor will incorporate activities involving written communication and teamwork into the course and announce them in advance.

Exams: Expectations and Scheduling

Exams assess students' understanding of course material and are administered through approved University testing centers (e.g., CASA or the Dart Center). Each student is responsible for scheduling and completing exams within the published exam windows.

Exam windows are announced well in advance to support planning and minimize conflicts. Missed exams receive a score of zero unless an excused absence is approved by the instructor (see Excused Absence Policy).

Exams

There will be three midterm exams and a final exam. Exams are scheduled for the following dates. Two weeks before each exam, each student must make a reservation in CASA or Dart for a specific day and time.

Table 3: Exam Schedule and Review Availability

Exam	Coverage	Questions	Exam Window	Review Opens
Exam 1	Chapters 10–12	22 (75 min)	Sept 28–30 (Mon.–Wed.)	Oct 1 at 8:00 AM
Exam 2	Chapters 13–15	22 (75 min)	Oct 26–28 (Mon.–Wed.)	Oct 29 at 8:00 AM
Exam 3	Chapters 16–18.4	22 (75 min)	Nov 30–Dec 2 (Mon.–Wed.)	Dec 3 at 8:00 AM
Final Exam	Chapters 10–18 (Cumulative)	29 (100 min)	Dec 8–11 (Tue.–Fri.)	Dec 12 at 8:00 AM

Exams must be completed on campus in a testing center (e.g., CASA or the Dart Center). Only scratch paper and the official Periodic Table will be provided (the same Periodic Table used in homework and quiz assignments). Exams are closed-book and closed-notes.

Each student is required to bring a pen or pencil, a scientific calculator (graphing calculators are not permitted), a student ID card, and must sign in using their CougarNet ID (username) and password.

Devices capable of receiving, transmitting, or recording data are not permitted in testing centers (e.g., cell phones, smart devices, cameras). Testing centers are actively proctored and video recorded to maintain fairness and exam integrity.

You are required to acknowledge an exam integrity agreement before each exam. After you complete your exam, you may not communicate anything regarding the contents to anyone other than your instructor until the exam answers have been released for review. A breach of these policies may violate the course examination policies and/or the UH Academic Honesty Policy. Exam attempts may be reviewed in WebAssign, with correct answers, for at least 3 "business" days (2 days for the final exam) after the exam closes. No requests for regrades will be accepted after the review period ends.

Exam Scheduling and Testing Center Policies

Each student is solely responsible for scheduling and completing the exam within the abovementioned exam windows. CASA Campus Services (CCS) will be used to schedule exams at the CASA testing centers (see <https://ccs.casa.uh.edu/>), and the Student Accessibility AIM Portal will be used to schedule exams at the DART testing center (see Student Accessibility Center - University of Houston).

The CCS/CASA reservation system typically opens two weeks before the start of each exam window. During the first three days, students participate in a preference-based scheduling process:

1. Day 1: Students submit a ranked list of their preferred exam dates and times.
2. At the end of each day, the system assigns reservations using the submitted preference lists. Students are selected at random, and each is assigned to the highest-ranked available time slot when their turn is processed.
3. If none of a student's preferred options are available, no reservation is made for that round.
4. Students should check their reservation status the following day. If they were not assigned a slot, or if they wish to pursue other available options, they can submit a new preference list for the next assignment round.
5. This process repeats for the first three days of the scheduling period.

After the initial three-day preference period, the system switches to real-time scheduling. At that point, any available exam slot can be selected and reserved immediately on a first-come, first-served basis.

It is strongly recommended that you reserve an exam time slot at a testing center as early in the scheduling process as possible. Each student must complete a reservation at least five business days before the exam window. Any scheduling conflict must be documented and brought to the instructor's attention at least one week before the exam start date.

Before the first exam, first-time CASA users must complete biometric registration (using CougarID and fingerprint).

Exam check-in begins 20 minutes before the scheduled reservation time. Late arrivals (more than 15 minutes) will result in the cancellation of the reservation. If you have

questions about CASA policies or procedures, see the CASA FAQ pages for more information: <https://uh.edu/casa/testing-center/faq>.

If you do not secure a reservation or miss your scheduled time and do not complete the exam within the regular exam window, you risk missing the exam and receiving a score of zero. Accordingly, you are responsible for planning ahead to ensure that all scheduling and examination policies are followed.

Failure to comply with exam policies may result in penalties assigned by the instructor, up to and including a score of zero on the exam. For example, possessing a cell phone, smart device, or any notes during an exam in CASA/DART violates examination policies.

ACADEMIC ADJUSTMENTS & AUXILIARY AIDS

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, regarding appropriate academic adjustments/auxiliary aids for disabled students. By Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you have a disability requiring academic adjustments/auxiliary aids, please contact the Justin Dart Jr. Student Accessibility Center (at <https://uh.edu/accessibility>) and discuss your request with your instructor. Please be aware that scheduling exams at the Dart Center must be completed at least five business days before the exam date, and availability is scheduled on a first-come, first-served basis. Students are responsible for following Dart Center policies and meeting its deadlines.

EXPECTATION OF EFFORT

Learning chemistry takes time and focused effort. For the fall session, a student should expect to devote, on average, 6-9 hours per week to preparation (beyond lecture time) to work toward mastery of the course topics. Additionally, many students improve their efficiency and effectiveness by using available academic resources to support their learning. Several such resources are listed below for your consideration:

Tutoring

Free tutoring is available from the following:

- Students in this course can use Knack tutoring to access qualified UH peer tutors, who are available to meet one-on-one, online, or on demand.
- For further information, see: UH.joinknack.com.

Free tutoring is available from the following (additional information provided on Canvas):

- LAUNCH tutors: <https://ussc.uh.edu/lss/tutoring.aspx>. Walk-in peer tutoring (no appointment necessary), located in Student Service Center 1 (Building 524) Room 212. Launch Tutoring Schedule Launch (uh.edu)
- Success Guides: <https://uh.edu/ussc/launch/services/handouts>
- Success Workshops: <https://uh.edu/ussc/launch/workshops>
- Success Coaching: <https://uh.edu/ussc/launch/coaching>

SELF-ASSESSMENT

You should identify methods to monitor your growth in knowledge and skills. For example, your completed assignment attempts can be reviewed in Canvas, and the corresponding scores can be used as metrics of your progress. Additionally, working on your homework assignments over several days rather than waiting until the deadline is a strategic approach. This leads to better retention and enables the identification of topic areas for further work as you work towards mastery. Finally, remember the closed-book/notes format of the exams as you work. For this reason, it is best to minimize the use of notes while you complete quizzes.

SELECTED TOPICS FOR SELF-PACED STUDY:

REVIEW, R-1 to R-10, is assigned as an independent self-study. The material may be included in Exam 1. Students are expected to read the text chapters and work the examples as needed. Additional exercises with answers (and sometimes specific feedback) are provided after each chapter.

Some course topics rely on memorized information and are best retained by developing familiarity over time. Here are a few tables from the book that contain information you will need to recall and use frequently in this course. You should work on learning the

content of these tables as soon as possible (you can use the electronic textbook's search function to locate the given tables easily).

Before exam 1:

- Names and symbols of the first 56 elements of the periodic table.
- Review: prerequisite chemical nomenclature in section 3.10.
- Review: prerequisite SI Units and prefixes
- Table 11.6 Kinetics for reactions- Zero, First or Second Order in [A] (pg. 466 in e-textbook)

Before Exam 2:

- Table 13.6 Acid-Base Properties of Various Types of Salts (pg. 564 in e-textbook)

Before Exam 3:

- Table 16.3 Interplay of ΔS_{sys} & ΔS_{surr} Determining Sign of ΔS_{univ} (pg. 651 in e-textbook)
- Table 16.5 Possible Combination of ΔH and ΔS for a Process (pg. 654 in e-textbook)
- Table 16.6 Qualitative Relationship Between the Change in ΔG and Equilibrium Constant (pg. 670 in e-textbook)
- Table 18.2 Various Types of Radioactive Processes Showing Changes in the Nuclides (pg. 731 in e-textbook)

Discussion and Lecture Topics

Table 4: Quick Overview

Book Chapter-Topic Title	Exam Unit	Homework(HW) Quiz(QZ)
Ch. 10 – Solutions	Unit 1	HW/QZ 2
Ch. 11 – Kinetics	Unit 1	HW/QZ 3–4
Ch. 12 – Equilibrium	Unit 1	HW/QZ 5
Ch. 13–14 – Acid/Base	Unit 2	HW/QZ 6–8

Book Chapter-Topic Title	Exam Unit	Homework(HW) Quiz(QZ)
Ch. 15 – Solubility	Unit 2	HW/QZ 9
Ch. 16 – Thermodynamics	Unit 3	HW/QZ 10
Ch. 17 – Electrochemistry	Unit 3	HW/QZ 11–12
Ch. 18.1 – 18.4 Nuclear	Unit 3	HW/QZ 13
Ch. 18.5 –end Nuclear	Final	HW/QZ 14

Course Content Summary by Chapter

CH 10. Solutions, Intermolecular Interactions, and Colligative Behavior (Unit 1, HW/Quiz 2)

Analyze and predict solution behavior by applying relationships between composition, intermolecular forces, and thermodynamic factors, including:

- calculation and conversion of concentration units
- quantitative application of colligative property relationships (e.g. Raoult's law, ΔT , π)
- evaluation of solubility based on molecular interactions and energetic/statistical factors

CH 11. Chemical Kinetics (Unit 1, HW/Quiz 3 and 4)

Determine and interpret reaction rates using experimental data and kinetic relationships, including:

- derivation and use of rate laws and integrated rate equations
- analysis of reaction order and rate constants
- evaluation of reaction mechanisms and catalytic pathways using kinetic evidence

CH 12. Chemical Equilibrium (Unit 1 → Unit 2 transition, HW/Quiz 5)

Apply equilibrium relationships to analyze chemical systems at equilibrium and predict

their response to change, including:

- construction and manipulation of equilibrium expressions (K_c , K_p)
- quantitative solution of equilibrium systems
- application of Q vs. K and Le Châtelier's Principle

CH 13 and 14. Acid–Base Systems and Aqueous Equilibria (Unit 2, HW/Quiz 6, 7, and 8)

Analyze and solve problems involving acids, bases, and aqueous equilibria using appropriate relationships, including:

- calculation of pH, pOH, and equilibrium concentrations
- application of K_a , K_b , and related expressions
- quantitative analysis of buffers, titrations, and polyprotic systems
- prediction of acid–base behavior from molecular structure and composition

CH 15. Solubility and Precipitation Equilibria (Unit 2, HW/Quiz 9)

Apply solubility equilibria relationships to predict and quantify dissolution and precipitation processes, including:

- use of K_{sp} expressions to determine solubility and ion concentrations
- prediction of precipitation using Q vs. K_{sp}
- qualitative and quantitative analysis of ionic systems

CH 16. Thermodynamics and Spontaneity (Unit 3, HW/Quiz 10)

Analyze chemical processes using thermodynamic relationships to determine directionality and feasibility, including:

- application of entropy, enthalpy, and Gibbs free energy relationships
- evaluation of temperature dependence of spontaneity
- quantitative use of ΔG relationships (ΔG° , $\Delta G = RT \ln Q$, $\Delta G^\circ = -RT \ln K$)

CH 17. Electrochemistry and Redox Systems (Unit 3, HW/Quiz 11 and 12)

Analyze oxidation–reduction processes and electrochemical systems using appropriate relationships, including:

- balancing redox reactions in acidic and basic environments
- calculation of cell potentials and their relation to free energy and equilibrium constant
- application of the Nernst equation to nonstandard conditions
- evaluation of electrochemical systems (galvanic and electrolytic)

Ch 18. Nuclear Chemistry (Unit 3 HW/Quiz 13 and Final, HW/Quiz 14)

Analyze nuclear processes using relationships between stability, decay, and energy, including:

- prediction and balancing of nuclear transformations
- application of half-life and decay relationships
- evaluation of binding energy and mass–energy relationships
- interpretation of nuclear processes in applied contexts

Grading Rubrics and Weights

GRADING

Course scores are calculated as a weighted average: 12% homework (HW) assignments, 6% quizzes (QZ), 2% core activities (Team & Communication), and 80% exams. Within the exam category, the relative weight is proportional to the number of exam questions (i.e., 22 for midterms and 29 for the final exam). The two lowest HW and two lowest QZ scores are dropped when computing the final grade. No exam scores will be dropped or curved. There is no unearned credit in this course.

Final Score = $0.12 \times \text{HW percentage} + 0.06 \times \text{QZ percentage} + 0.02 \times \text{core activities percentage} + 0.80 \times \text{exam percentage}$

Decimal values greater than or equal to 0.5 are rounded up to the nearest whole number. Letter grades will be assigned based on the final score and the grading scale given in the table below:

Grading Scale

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90% and above	85 - 89	80 - 84	76 - 79	72-75	67 - 71	62 - 66	56 - 61	54 - 55	52 - 53	50 - 51	49% and below

Course Policies and Procedures

ACADEMIC ADJUSTMENTS & AUXILIARY AIDS

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, regarding appropriate academic adjustments/auxiliary aids for disabled students. By Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you have a disability requiring academic adjustments/auxiliary aids, please contact the Justin Dart Jr. Student Accessibility Center (at <https://uh.edu/accessibility>) and discuss your request with your instructor. Please be aware that scheduling exams at the Dart Center must be completed at least five business days before the exam date, and availability is scheduled on a first-come, first-served basis. Students are responsible for following the policies and meeting the deadlines of the Dart Center.

EXCUSED ABSENCE POLICY

This course is covered by the University of Houston Undergraduate Excused Absence Policy (including Military and Religious Holy Days). (<https://uh.edu/provost/policies-resources/student/excused-absence-policy>):

1. If you miss an exam for circumstances consistent with the Excused Absence Policy, notify your instructor (via email) five business days before the exam if possible or as soon as possible after the exam date (preferably via email within 24 hrs). Late excuses will not be accepted.
2. To verify your excused absence, documentation (as defined within the UH Absence Policy) must be submitted to your instructor within five business days from the end date of the exam. The excused absence policy can only be applied to a maximum of one exam. A second missed exam may result in a penalty assigned by the instructor, up to and including a score of zero.
3. Additional policies address excused absences for reasons not covered in this policy, including the following: religious Holy Days, days of required military service, pregnancy and related conditions, and disability. If possible, the

instructor must be informed of the absence at least five business days in advance, and the Holy Day observance or service day must documentarily encompass the entire period in which the exam is offered.

4. The instructor may provide a make-up exam or use your final exam percentage to calculate and replace the missing score to accommodate an exam excused by your instructor. Other accommodations, as specified by the instructor, may also be used when appropriate.
5. Missed exams count as zero unless excused by the instructor.

Note: Once you complete an exam, the score will be used. A claim that a medical or family emergency caused poor performance cannot be used to justify a second exam attempt, and the absence policy does not apply to such a circumstance.

CLASSROOM BEHAVIOR

The ability to learn is diminished when people engage in inappropriate classroom conduct. Therefore, to safeguard the learning environment, the University of Houston has created the Student Code of Conduct: Student Code of Conduct - <https://uh.edu/dos/behavior-conduct/student-code-of-conduct>. To help manage and prevent inappropriate conduct, the instructor has the right as a University official to request that a student move to a defined seat, contact the instructor after class, provide identification, and/or exit the classroom immediately for the remainder of the period. Failure to comply with such requests will result in sanctions as described in the Code of Conduct.

DISCRIMINATION & SEXUAL MISCONDUCT REPORTING

All UH community members are responsible for contributing to and upholding a safe environment that enhances learning. Discrimination and sexual misconduct undermine our community, and incidents should always be reported. A reporting form and information are available on the Equal Opportunity Services (EOS) website at Equal Opportunity Services (EOS) - <https://uh.edu/equal-opportunity/>

INCOMPLETE POLICY

An Incomplete Grade will be awarded ONLY if a student who is otherwise passing misses the final exam for a documented, legitimate reason beyond his or her control (e.g., a documented illness, serious accident, death in the family, religious Holy Day, etc.). The instructor alone will decide whether to accept the student's documentation for missing the

final exam. If the instructor does not determine that the student missed the final for a legitimate reason, the student will not receive an Incomplete Grade, and the final exam score will be marked as zero.

To remove an Incomplete Grade, students must take the final exam at the time and place assigned by the instructor or his/her representative. The items and timeframe for completing the work will be provided in writing using the NSM Incomplete Grade Agreement. If you fail to take the final exam at the time and place assigned by the instructor, you will receive a zero on the final exam, and the zero score will be used to compute your final letter grade.

DROPPING THE COURSE AND RELATED POLICIES

Be sure to acquaint yourself with information about the enrollment cap, the "three-peat" rule, and the six-W rule. Information can be found in the UH online catalog or at <http://www.uh.edu/provost/policies-resources/student>.

It is your sole responsibility to drop the course for any reason. The Instructor will not drop the course for you. You must do it yourself:

<https://www.uh.edu/provost/students/student-policies/index#dropinfo>

Students who earn a D+ or lower in a course during their first year at the University of Houston (UH) may repeat the course within 12 months and exclude the original grade from their cumulative GPA. For further information, see:

<https://www.uh.edu/provost/students/student-policies/grade-exclusion/>

EMERGENCY UPDATES

The University of Houston will communicate Emergency Alerts at: <https://alerts.uh.edu/>.

SYLLABUS CHANGES

The instructor reserves the right to modify this syllabus as necessary due to public health guidance, weather-related disruptions, or other unforeseen circumstances. Notice of changes will be communicated through Canvas.

University Policies and Student Support Resources

Mental Health and Wellness Resources

The University of Houston has a number of resources to support students' mental health and overall wellness, including [CoogsCARE](#) and the [UH Go App](#). [UH Counseling and Psychological Services \(CAPS\)](#) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off- campus. For assistance visit uh.edu/caps, call 713-743-5454, or visit a [Let's Talk](#) location in-person or virtually. Let's Talk are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

Need Support Now? If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text 988, or chat 988lifeline.org.

Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office (known at UH as the Equal Opportunity Services office or "EOS"). Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the UH [Title IX/Sexual Misconduct Resources page](#). Please note that you may also report concerns of discrimination based on your protected class identity to EOS.

Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about

academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: <https://uh.edu/accessibility/> calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU.

The [Student Health Center](#) offers a Psychiatry Clinic for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The [A.D. Bruce Religion Center](#) offers spiritual support and a variety of programs centered on well-being.

The [Center for Student Advocacy and Community \(CSAC\)](#) is where you can go if you need help but don't know where to start. CSAC is a "home away from home" and serves as a [resource hub](#) to help you get the resources needed to support academic and personal success. Through our [Cougar Cupboard](#), all students can get up to 30 lbs of FREE groceries a week. Additionally, we provide 1:1 appointments to get you connected to on- and off-campus resources related to essential needs, safety and advocacy, and more. The [Cougar Closet](#) is a registered student organization advised by our office and offers free clothes to students so that all Coogs can feel good in their fit. We also host a series of cultural and community-based events that foster social connection and helps the cougar community come closer together. Visit the CSAC homepage or follow us on Instagram: @uh_CSAC and @uhcupbrd. YOU belong here.

Cougar Parent and Family Engagement Office

This office, under the Dean of Students Office (<https://www.uh.edu/dos/>), coordinates resources for Pregnant and Parenting Students (<https://www.uh.edu/dos/parenting-students/>), Parents and Family members of UH students (<https://www.uh.edu/dos/parents/>), and Sexual Misconduct Support Services (<https://www.uh.edu/dos/sexual-misconduct-support-services/>). A description of available support and resources are provided on the respective web pages. The Cougar Parent and Family Engagement Office is located in Student Center South, room B12.

Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The [UH Academic Honesty Policy](#) is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the [Justin Dart, Jr. Student Accessibility Center](#). If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not

authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.