

**Instructor:** Joe Burnett (he/him/his)

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**Office hour location:** 1761 Gilman Hall

**Office hours:** Mondays 2:30 – 3:30 pm,  
Thursdays 1:10 – 2:30 pm,  
and by appointment

**Head Teaching Assistant:** Hayley Masching (she/her/hers)

**Email:** [177Q@iastate.edu](mailto:177Q@iastate.edu)

**Chemistry Help Center Location:** 1761 Gilman Hall

**Chemistry Help Center Hours:** Tuesdays 11 am – 12 noon  
and by appointment

**Course prerequisites/corequisites:** Credit or concurrent enrollment in CHEM 177L. MATH 140 or 2 years of high school algebra and 1 year of high school geometry and CHEM 50 or 1 year of high school chemistry necessary.

**CHEM 177 and 177L are co-requisite courses**, i.e., students in Chem 177 are required to take Chem 177L at the same time or to have already received credit in 177L. **Co-requisite course requirements are strictly enforced: Students who do not meet the co-requisite should drop the course or they will receive an F in the course.** Students who drop or audit Chem 177 will be required to drop 177L and vice versa. Students may not register to audit Chem 177 after 5:00 PM on Friday September 2nd, 2022. The audit does not count towards full-time student status. To add or drop recitation or lab sections during the first week of class, use AccessPlus. After the first week, please email [amwade@iastate.edu](mailto:amwade@iastate.edu) or call 515-294-6361. The last day to drop CHEM 177 is October 28th.

**PLEASE NOTE:** CHEM 177L is administered separately from this course. For questions regarding lab issues, contact Dr. Sara Pistolesi (the lab instructor) at [sarachem@iastate.edu](mailto:sarachem@iastate.edu) and/or your lab TA.

### Course Catalog Description

(4-0) Cr. 4. F.S.SS.

The first semester of a two-semester sequence which explores chemistry at a greater depth and with more emphasis on concepts, problems, and calculations than 163. Recommended for physical and biological science majors, chemical engineering majors, and all others intending to take 300-level chemistry courses. Principles and quantitative relationships, stoichiometry, chemical equilibrium, acid-base chemistry, thermochemistry, rates and mechanism of reactions, changes of state, solution behavior, atomic structure, periodic relationships, chemical bonding. Chemistry and Biochemistry majors may consider taking CHEM 201. Only one of Chem 163, 167, 177, or 201 may count toward graduation.

### Learning Outcomes

- 1. By completing the course, the students will be able to interpret and explain** the connection between symbolic representations (the microscopic level) and the amounts of substance (the macroscopic level) when given a qualitative or quantitative problem involving a chemical system. To achieve this goal, students will learn about atoms, bonding, and chemical reactions.
- 2. By completing the course, the students will be able to assess, describe, and ultimately predict** the chemical and physical properties of elements and compounds (gaseous, liquid, and solid materials). To achieve this goal, students will learn about structure, bonding, and inter-molecular interactions.
- 3. By completing the course, the students will be able to recognize** the importance of energy in chemical and physical processes and will **assess** and **describe** the feasibility and energetic implications of any process under specific conditions. Students will learn about energy and thermodynamics.
- 4. By completing the course, the students will be able to** make connections between topics seen within this course as well as between chemistry and other disciplines such as physics, natural sciences, engineering.

### Required Textbook and Supplies

The required textbook and online homework system are available through Canvas as part of Iowa State University's **Immediate Access Program**. You will receive an email shortly before classes start that will instruct you on how to access the required digital course materials. You may not be able to access the digital content until the first day of class. For information about Immediate Access, please visit: <https://www.isubookstore.com/immediate-access-students>. For questions or problems with Immediate access, please email [immediateaccess@iastate.edu](mailto:immediateaccess@iastate.edu).

- **Chemistry, 10<sup>th</sup> Edition** - by Zumdahl, Zumdahl, and DeCoste, Cengage. Immediate Access, available through Canvas.
- **OWLv2 online homework** – Immediate Access, available through Canvas.
- **A scientific calculator** with basic functions including logarithms and exponential functions. The use of scientific/graphing calculators is permitted during tests (quizzes and exam), but students must not use the calculator for purposes other than calculations during the test (for example, do not store formulas and other information pertaining to the chemistry content on the device). Proctors reserve the right to inspect and confiscate the calculator. Spare calculators are provided during exams.
- This course will use the **Top Hat** response system in class. In Canvas, click on the Top Hat 1.3 link on the left side of the page to get started. Visit the Top Hat learning tool guide to view the terms of service, privacy policy, accessibility statement, and instructions for joining the Top Hat course and engaging with the Top Hat course.

## Assessments and Grading

**Pre-Lecture Explorations or PLEs.** There will be a few questions to be answered on Canvas before each lecture. These are designed to encourage you to read the textbook in preparation for lecture. All PLEs will be due at 10 am on each lecture day (so they will be due Mondays, Wednesdays, and Fridays at 10 am). There will be no extensions. Over the course of the semester, there will be 40 PLEs. The top 30 PLE scores will count towards the overall grade. **PLEs contribute 5% to the final grade.**

**Micro-Quizzes or MQs.** Micro-quizzes or MQs are delivered several ways: 1) Top Hat questions in lecture, 2) quizzes on Canvas (often as self-reflection after exams), 3) short assignments on OWL, etc. There will be no extensions. Over the course of the semester there will be a **minimum** of 47 MQs. The top 40 MQs will count towards the overall grade. **MQs contribute 5% to the final grade.**

**Homework assignments or HW.** Homework or HW will be delivered through OWL (immediate access program online homework system). Over the course of the semester, there will be 10 HW assignment, one for each chapter. Late submissions will be accepted but penalized 10%. There will be no extensions. **All 10 HW assignments will count towards the overall grade. HWs contribute 10% to the final grade.**

**Recitation Worksheets or RWs.** Recitation Worksheets or RWs are administered weekly in recitations. RWs consist of a number of general chemistry questions or problems for students to solve. Students may work together in small groups (3 or 4) or individually depending upon the student's preference. At the end of the recitation, each student must submit their own completed RW. Over the course of the semester, there will be 15 RWs. The top 12 RWs will count towards the overall grade. This policy is designed to give students the flexibility to miss up to 3 recitations. If a student knows in advance that they will miss a recitation, they should send an email to [177Q@iastate.edu](mailto:177Q@iastate.edu) to request permission to attend a different recitation section that day. **RWs contribute 15% to the final grade.**

**Exams.** There will be 4 hour-long exams on Tuesday evenings: Sep 12, Oct 10, Nov 7, and Nov 28 from 6:45 – 7:45 pm. Add these dates and times to your planner to avoid schedule conflicts. Exams are multiple choice and machine-scored. The top 3 exam scores will count towards the overall grade. Each of the top three exam scores contribute 15% to the final grade; the **night exams make up 45% of the final grade.**

**Final Exam.** Final examinations will be held May 8-11 (Mon-Thur). The date and time of the CHEM 177 final exam is determined by the Registrar's Office and will be announced through Canvas as soon as it is available. Do not schedule any travel until you have all your final exam dates confirmed. Alternative final exam times will only be scheduled for students with a conflicting final exam time or those with three or more finals scheduled for the same day. There will be no exceptions. **The last day to request an alternative time for the final exam is Friday Dec 1 at 3 pm.** The university final examinations policy will be followed strictly. Our final exam will be a 2-hour, comprehensive exam and it will be in the multiple-choice format on bubble sheet. **The final exam contributes 10% to the final grade.**

## Grade Distributions

Assessments	Weight
Top-30 PLEs	5%
Top-40 MQs	5%
HW (all)	10%
Top-12 RW	15%
Top-3 Exams	45%
Final Exam	20%
Total	100%

## Grading Scale

Letter Grade	Range	Letter Grade	Range
A	93.00-100	C	73.00-76.99
A-	90.00-92.99	C-	70.00-72.99
B+	87.00-89.99	D+	67.00-69.99
B	83.00-86.99	D	63.00-66.99
B-	80.00-82.99	D-	60.00-62.99
C+	77.00-79.99	F	<60

**Grading Policies:** The final grade distribution will be consistent with prior semesters. The instructors reserve the right to adjust the grading scale. Important: final grades are based solely on graded work and are NOT negotiable; no single student will be offered make-up or extra credit points.

### Hour Exam Policies

**Card-stock periodic table:** In the first recitation, students will be provided with a card-stock periodic table for use on all exams and recitation worksheets (RWs). Students may write anything anywhere on the document with one rule - it must be handwritten in non-erasable INK. Students may use both sides of the page. Instructors & your TA may make spot checks throughout the semester. If you lose your periodic table, you will NOT receive a replacement; however, each exam will contain a periodic table so losing the card stock version will only mean you lose access to your notes. Producing a replacement or using pencil or erasable ink to subvert these rules constitutes academic misconduct. All needed equations and constants and data will be provided on all of the exams.

**Exam locations:** You will be assigned an exam location depending on your recitation section as soon as this information is available. Students are given instructions on where and how to seat in the classroom during the exam. Proctors are permitted by the instructors to request that students move to the seats in the front of the classroom at any time during the exam. This will not affect the exam score in any way; however, should a student refuse to change seats, the instructor will be notified.

**Missed Exams:** There are no make-up exams. Excused absences are limited to official and documented university activities and documented health-related absences. If you know you will miss an exam in advance, even if it is not an officially excused absence, I will try to work with you to let you take the exam at an alternative time. It is the student's responsibility to ensure that such arrangements are made well in advance. Non-official excuses are subject to my approval. There are many reasonable excuses for missing an exam, including illness, job interviews, travel and the like. The policy of counting the top-three exam scores give students the flexibility to miss an exam. Students who miss more than one exam will be asked to drop the course.

**Regrade requests:** Graded hour exams will be returned in recitation. Any request for a re-grade must be clearly given in writing on the back of the exam before leaving the recitation room – special instructions for re-grade requests will be given after the first exam. Information specific to each exam will be communicated via email and on Canvas.

### Issues or Concerns With Course Policy or Grading Conflict Resolution.

If you have questions or concerns about course policies and/or if you have a problem in class or recitation: promptly write an email or speak in person detailing your concerns to your instructor, or your TA and CCing the course instructor; if the problem is not solved, meet with the course instructor; if a resolution cannot be reached, the professor will refer you to the proper channels for [filing a complaint](#). Most issues can be resolved if a student makes an appointment with a faculty or staff member and communicates their concerns in person.

## Important Dates in the Semester

Aug 25:	Last day to drop a course and not appear on permanent record. Last day to change schedules using AccessPlus
Sep 1:	Last day to audit a course. An audit does not count towards full-time student status
Sep 4:	Labor Day – university holiday
<b>Sep 12:</b>	<b>Exam 1 @ 6:45 pm (Tuesday evening)</b>
Sep 29-13:	Mid-term evaluations administered on Class Climate
<b>Oct 10:</b>	<b>Exam 2 @ 6:45 pm (Tuesday evening)</b>
Oct 13:	2:15 p.m. – Mid-term reports due (C-, D, F grades are reported)
Oct 27:	Last day to drop a course or withdraw without extenuating circumstances
Nov 1:	Final Exam Schedule posted at: <a href="https://www.registrar.iastate.edu/students/exams/fallexams">https://www.registrar.iastate.edu/students/exams/fallexams</a> <b>Do not make travel plans until after the final exam has been scheduled.</b>
<b>Nov 7:</b>	<b>Exam 3 @ 6:45 pm (Tuesday evening)</b>
Nov 21-24:	Fall Break (no classes)
Apr 21-May 5:	End of semester course evaluations administered on Class Climate
<b>Nov 28:</b>	<b>Exam 4 @ 6:45 pm (Tuesday evening)</b>
<b>Dec 1:</b>	<b>Last day to request an alternate time to take the final exam in case of conflicts</b>
Dec 4-8:	Prep Week
<b>Dec 11-14:</b>	<b>Cumulative Final Exam Date &amp; Time TBA:</b> <a href="https://www.registrar.iastate.edu/students/exams/fallexams">https://www.registrar.iastate.edu/students/exams/fallexams</a> <b>Do not make travel plans until after the final exam has been scheduled.</b>

## Tentative Schedule of Topic Coverage:

Week	Dates	Chapter
1	Aug 21-25	Ch. 1: Chemical Foundations
2	Aug 21-Sep 1	Ch.2: Atoms, Ions, and Molecules
3	Sep 4-8	Ch. 3: Stoichiometry
4	Sep 11-15	Ch. 3: Stoichiometry Ch. 4: Solution Stoichiometry
5	Sep 18-22	Ch. 4: Solution Stoichiometry Ch. 5: Gases
6	Sep 25-29	Ch. 5: Gases Ch. 6: Thermochemistry
7	Oct 2-6	Ch. 6: Thermochemistry
8	Oct 9-13	Ch. 7: Atomic Structure and Periodicity
9	Oct 16-20	Ch. 7: Atomic Structure and Periodicity Ch. 8: Bonding, General Concepts
10	Oct 23-27	Ch. 8: Bonding, General Concepts
11	Oct 30-Nov 3	Ch. 9: Covalent bonding, Orbitals
12	Nov 6-10	Ch. 9: Covalent bonding, Orbitals
13	Nov 13-17	Ch. 10: Liquids and Solids
	Nov 20-24	Fall Break
14	Nov 27-Dec 1	Ch. 10: Liquids and Solids
15	Dec 4-8	Prep Week, Review
	Dec 11-15	Final Exam

## SYLLABUS STATEMENTS ON SAFETY, BEHAVIOR, RESPECT, AND UNIVERSITY POLICIES

**Accessibility Statement:** Iowa State University is committed to advancing equity, access, and inclusion for students with disabilities. Promoting these values entails providing reasonable accommodations where barriers exist to students' full participation in higher education. Students in need of accommodations or who experience accessibility-related barriers to learning should work with Student Accessibility Services (SAS) to identify resources and support available to them. Staff at SAS collaborate with students and campus partners to coordinate accommodations and to further the academic excellence of students with disabilities. Information about SAS is available online at [www.sas.dso.iastate.edu](http://www.sas.dso.iastate.edu), by email at [accessibility@iastate.edu](mailto:accessibility@iastate.edu), or by phone at 515-294-7220. **Students with academic accommodations MUST communicate with the course instructor.**

**Usability, disability and design:** I am committed to creating a course that is inclusive in its design. If you encounter barriers, please let me know immediately so that we can determine if there is a design adjustment that can be made or if an accommodation might be needed to overcome the limitations of the design. I am always happy to consider creative solutions as long as they do not compromise the intent of the assessment or learning activity. You are also welcome to contact the Student Accessibility Services (515-294-7220) to begin this conversation or to establish accommodations for this or other courses. I welcome feedback that will assist me in improving the usability and experience for all students.

**Religious Accommodation:** Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the Dean of Students Office (<https://www.studentassistance.dso.iastate.edu/>) at 515-294-1020 or the Office of Equal Opportunity, (<https://www.eoc.iastate.edu/>) at 515-294-7612.

**Discrimination and Harassment:** Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3410 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email [eooffice@iastate.edu](mailto:eooffice@iastate.edu).

**Prep Week:** This class follows the Iowa State University Prep Week policy as noted in section 10.6.4 of the Faculty Handbook, (<https://www.provost.iastate.edu/faculty-and-staff-resources/faculty-handbook>).

**Public Health:** If you are not feeling well, please stay home and focus on your health. Should you miss class 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. **Public health information for the campus community continues to be available on Iowa State's public health website. All public health questions should be directed to [publichealthteam@iastate.edu](mailto:publichealthteam@iastate.edu).**

**Classroom etiquette, mutual respect and professionalism:** You are expected to treat your instructor and all other participants in the course with courtesy and respect. Please refrain from distracting behavior during class (talking, texting, watching videos, etc.). It is the instructor's goal to promote an atmosphere of mutual respect in the classroom. Please contact the instructor if you have suggestions for improving the classroom environment.

**Name, gender identity and/or gender expression:** Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me or your teaching assistant accordingly early in the semester so that I may make appropriate changes to my records.

### Promoting student health and wellness

- Iowa State University is committed to proactively facilitating the well-being of all students. We welcome and encourage students to contact the following on-campus services for assistance regarding their physical, intellectual, occupational, spiritual, environmental, financial, social, and/or emotional needs.
- Wellbeing resources for students: <https://www.cyclonehealth.iastate.edu/wellbeing-resources/>
- Student Wellness call (515) 294-1099 or via the website (<http://studentwellness.iastate.edu>);
- Thielen Student Health Center call (515) 294-5801 (24/7 Medical Advice) or via the website (<http://www.cyclonehealth.org>);
- Student Counseling Services call (515) 294-5056 or via the website (<https://counseling.iastate.edu>)
- Recreation Services call (515) 294-4980 or via the website (<http://recservices.iastate.edu>)
- Students dealing with heightened feelings of sadness or hopelessness, thoughts of harm or suicide, or increased anxiety may contact the ISU Crisis Text Line (Text ISU to 741-741) or contact the ISU Police Department (515) 294-4428.

**Academic Dishonesty:** The class will follow Iowa State University's policy on academic misconduct (5.1 in the Student Code of Conduct). Students are responsible for adhering to university policy and the expectations in the course syllabus and on coursework and exams, and for following directions given by faculty, instructors, and Testing Center regulations related to coursework, assessments, and exams. Anyone suspected of academic misconduct will be reported to the Office of Student Conduct in the Dean of Students Office: <https://www.studentconduct.dso.iastate.edu/academic-misconduct/armfacultystaff>. Information about academic integrity and the value of completing academic work honestly can be found in the Iowa State University Academic Integrity Tutorial: <https://iastate.pressbooks.pub/academicintegrity/>.

**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 issues, email [academicissues@iastate.edu](mailto:academicissues@iastate.edu). (This email address for contact information is monitored and answered through the Office of the Senior Vice President and Provost.)