

CHEM 167 | Chemistry for Engineering Students

4 credits

Prerequisites:

MATH 140 or high school equivalent and 1 year of high school chemistry or CHEM 50.

Instructor and Contact

Instructor: Dr. Diana Thatcher

E-mail: thatcher@iastate.edu

Lecture: Monday, Wednesday, Friday at 8:50am – 9:40am in 1002 Gilman Hall.

Recitation: Tuesday (check your schedule for time and location)

Office Hours

Instructor: Diana Thatcher. **Office Hours:** Monday 2:00 – 3:00pm & Thursday 11:00am-12:00pm in 155 Science Hall (aka Science I) or by appointment.

Virtual office hours available with flexible hours. Email thatcher@iastate.edu to request a time to meet via Zoom.

Head TA: Madelyn Austin. **Email:** austinmi@iastate.edu **Office Hours:** Chemistry Help Center TBD.

Contacting the Instructors/Head TA: We encourage you to contact your instructor or the Head TA whenever you need help with the course material or you have other questions or concerns related to the course. Response time is within 24 hours.

Use the Help Forum on the Canvas course page to ask questions/concerns about the course - navigating Canvas, lecture videos, quizzes, exams, how to approach a homework problem, etc.

Use email (thatcher@iastate.edu) for questions/concerns that are personal in nature – schedule an appointment, SAAN, etc. Please add Chem 167 in the subject line!

Tech Support Email: elotech@iastate.edu (Engineering-LAS Online Learning (ELO) for COE and LAS only. Please enter your respective college's tech support email if you do not belong to COE or LAS). Go to [Canvas Help](#) for more information on finding help with Canvas.

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 evaluate** chemical reactivity kinetically and thermodynamically. The latter goal will culminate in the profound understanding of the fundamental concept of equilibrium.
- 5. 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.

Course Format

Lectures and recitation sections are **in-person**. Canvas is used to deliver content and crucial information. The digital content includes the eBook and the online platform OWLv2 which is used for homework.

On Canvas, you can find a detailed schedule with the dates by which you are expected to complete the Modules and the corresponding assignments, including exams.

Recitations are led by a teaching assistant (TA) where you can ask questions, seek assistance with homework, tests, and worksheets.

Required Technology

1. A reliable Internet connection.
2. Access to Iowa State University computer system and Canvas.

Required Textbook and Supplies

1. Chemistry for Engineering Students, 4th Edition - by Brown and Holme, Cengage.
2. OWLv2 online homework. **Immediate Access Program**.
3. This course will use the **Top Hat** response system in class. 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. (Code: 822279)
4. A scientific calculator with basic functions including logarithms and exponential functions.

This course is enrolled in the Iowa State University Immediate Access Program. Immediate Access is a collaborative program where the University Book Store, faculty, and publisher have worked together to ensure access to Cengage Learning's "**CHEMISTRY F/ ENGINEERS+OWL V2**" courseware the first day of class at a reduced price compared to the national average. *The courseware is required to complete online homework assignments and includes access to the eBook.* Your instructor will provide directions on how to access the courseware through the Canvas course.

What is Immediate Access?

Immediate Access is a collaborative affordability initiative between the ISU Book Store, faculty and publishers. Students that are enrolled in an Immediate Access course will receive access to all required digital course materials the first day of class at a reduced cost compared to the national average.

What digital content is required for this course?

The following Cengage Learning OWL V2 courseware is required for your course:

Chemistry f/ Engineers+OWL V2 (Brown/Holme) Cengage; ISBN: 9780357295922; Price to Students: \$96.90; Duration: 180 days (two semesters).

How do I access the required digital content?

Cengage Learning's OWL courseware is required to do online homework for your course. To access OWL in your canvas course:

- A. Go to Modules, OWL (homework) and eBook | Chemistry for Engineering Students 4e. Click on **Week 1 – January 15-19, 2024-HW-01**. You can also go to Assignments, Homework (OWL) and click on **HW-01**.
- B. **Important:** The FIRST TIME you want to access the digital content, you must access OWL. Do not attempt to open the eBook unless you are registered on OWL.
- C. Register for OWL using your Iowa State email. Once you register for the course you should have access to the OWL platform. There is no access code to register. If you are prompted to enter an access code or pay for a code, please email Immediate Access at immediateaccess@iastate.edu. Do not pay for a new code.
- D. An eBook is included and accessed within the OWL Courseware only. After you are registered in OWL, you may open the eBook using the link **eBook for Brown Holmes Chemistry for Engineering Students** (or from OWL). There is no eBook accessible through the RedShelf Course Materials tool.

How is Immediate Access billed?

You will be automatically charged on your u-bill for this digital content. The billing description on your Ubill will appear as CHEM 167 IMMED ACCESS #####. The amount charged on your Ubill will be the same as the amount listed as the "Price to Student" listed above in the digital content requirements.

What if I drop the course?

Students who drop the course within the first 10 days of class will receive a refund on their u-bill (**5 days for courses 8 weeks or shorter**). YOU DO NOT HAVE TO NOTIFY THE BOOKSTORE IF YOU DROP THE COURSE. This is an automated process.

Can I opt out of Immediate Access?

Students may choose to opt out of the program. Opting out does not mean you are dropping the course. It simply means you are choosing not to receive the digital content from the bookstore and you must find another way to acquire it in order to complete required homework assignments. Students have within the first 10 days of class to opt out and receive a refund to their u-bill (5 days for courses 8 weeks or shorter). Instructions on how to opt out will be emailed shortly before classes start.

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

Assignments and Grading

- **Lecture quizzes (Top Hat).** Quizzes will be given during most classes using Top Hat. Lecture quizzes are an integral component of lecture and are designed to improve student engagement and learning. They are given in a relaxed environment and should not be source of stress. **Lecture quizzes weigh 10% towards your final grade.** You may monitor your performance directly on the Top Hat app or website. **To receive full credit, you must have a cumulative score of 75% or higher on Top Hat.** For example, if at the end of the semester you obtain 75% or higher you will receive 100% on Canvas, if you obtain 60% you will receive 80%, etc. Lecture quizzes scores will be uploaded on Canvas only at mid-term and the end of the semester. Make sure to monitor your performance on the Top Hat app or website. See Canvas, Modules, Top Hat, for more information. Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the inapp support button, or by calling 1-888-663-5491.
- **Homework.** OWL will be used for homework assignments. You must purchase access to OWL to receive credit on homework (it is part of the Immediate Access program); to login, follow the single sign on located on Canvas, Module. See Schedule on Canvas for exact dates. **Assignments are due on Sunday at 11:55pm.** If a homework assignment is completed between 11:55pm and 8:55 am following the due date, a **10% penalty** will be applied to the grade for that assignment. Homework sets are designed to help you master the topics: you have 4 attempts on each problem and hints are provided to you; in addition, there is no time limit (except of course for the actual deadline). For example, you can open the assignment on Monday, work on two problems, go back each day after that and complete additional problems. Remember to submit only when you are all done! **Homework is designed to help you master a topic before we move on to the next topic; thus, you must complete the work by the scheduled deadline.** There are no exceptions to this policy and no extensions or make-ups for OWL assignments will be granted. At the end of the semester, **2 lowest scores will be dropped**, including zeros due to missed submissions. **Homework contributes 20% to your final grade.**
- **Recitations & recitation quizzes:** On Tuesdays, you will meet in smaller groups with a teaching assistant (TA). Recitations will be used to discuss questions, end-of-chapter problems, and material from the lectures or text. Graded quizzes and exams will be returned to you in recitation. A short 10-point quiz or worksheet will be given during recitation sessions. **Out of 15 recitation quiz/worksheet scores, the best 10 will be counted.** This grading policy gives flexibility to miss several recitations in case of conflicts or illness. In order for our teaching team to grade and return all graded quizzes in a timely manner, they need to be submitted as scheduled (in recitation); therefore, exceptions cannot be allowed, under no circumstances. There are no make-up quizzes. **Recitation quizzes contribute 20% to your final grade.**
- **Exams.** There will be 3 hour-exams on **Wednesday, February 7, March 6, April 10 during class time.** These dates are subject to change; changes will be announced in class and on Canvas. Add these dates and times to your planner to avoid schedule conflicts. Students are given instructions on 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. There are no make-up exams. If you have a valid, serious reason to miss an hour exam, you need to immediately contact the instructor (not your TA). You will be asked to drop the course if you miss more than one exam. Your graded hour exams will be returned in recitation the following week. Our exams are in the multiple-choice format on bubble sheet. 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. **Hour exams contribute 30% to your final grade.**

- **Final Exam.** The date and time of the CHEM 167 final exam is **Tuesday, May 7, 2024 from 7:30-9:30am**. 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 April 26 at 5 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 20% to your final grade.**

Grade Distribution

Assessments	Percentage
Lecture quizzes (Top Hat)	10%
Recitation quizzes	20%
Homework (OWL)	20%
Hour-Exams	30%
Final Exam	20%
Total	100%

Grading Scale

Letter Grade	Range	Letter Grade	Range
A	93.00-100	A-	90.00-92.99
B+	87.00-89.99	B	83.00-86.99
B-	80.00-82.99	C+	77.00-79.99
C	73.00-76.99	C-	70.00-72.99
D+	67.00-69.99	D	63.00-66.99
D-	60.00-62.99	F	59.99 and below

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.

Course Policies

Late or missing assignments

Lecture quizzes, homework, and recitation quizzes assignments are designed to help you master a topic before we move on to the next topic; thus, **you must complete the work by the scheduled deadline**. Late submissions are accepted on OWL (see above). The grading policies outlined for lecture quizzes, recitation quizzes, and homework assignments give significant flexibility for you to miss a lecture, recitation, or assignment without hurting your overall grade. These policies are designed to allow for absences or missed assignments due to illness, emergency, or other unavoidable conflict. This said, please contact your instructor and/or TA if you would like to discuss your absence. You must contact us as soon as possible, see next section.

Deadline extensions

Deadlines are firm. Communication is important: if you know you will be unable to complete an assignment because of illness or another emergency, contact your instructor in advance. If the illness or other emergency happens on the day the assignment is due, you must contact the instructor ASAP. Missing an exam will affect your grade significantly: if you have a valid, serious reason to miss an hour exam, you need to immediately contact the instructor (not your TA). You will be asked to drop the course if you miss more than one exam.

Cheating and plagiarism

Please review the information under Academic Misconduct

Expected online or classroom behaviors

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

Ground rules for the exams and recitation quizzes

You must work independently.

You are permitted use the following authorized resources to complete the exams:

- Scientific or graphing calculator.
- Paper and pens/pencils (any work on scratch paper will not be graded.)
- The issued card-stock periodic table.

You are NOT permitted to do the following:

- You may NOT communicate with anyone else about the exam.
- You may NOT have anything else but the items mentioned above on your desk.
- You may NOT use any electronic devices (except for a calculator) and notes/textbooks.
- You may not use any other resources but your mind! **We actively monitor for illicit behavior.**

Ground rules for homework (HW) assignments

[Exams and recitation quizzes have stricter rules, see the corresponding part above]

You are permitted use the following authorized resources to complete HW:

- Scientific or graphing calculator, Excel (for calculations.)
- Paper and pens/pencils (any work on scratch paper will not be graded.)
- Your course notes and book.
- CHEM 167 Canvas course content and any links to external webpages that are provided therein.
- You may post questions about HW on the Help Forum and/or ask your TA; you will not receive a direct answer (e.g. the solution to the problem) but you will be advised on how to proceed towards the solution.
- Group work is encouraged at this stage in your learning, but you must also practice solving independently.

You are NOT permitted to do the following:

- You may NOT have someone else solve the questions for you.
- You may NOT post and/or consult unauthorized aids, including paid-for subscriptions to Chegg, Scribd, or tutoring services.
- You may NOT search the questions in a search engine (e.g. Google).

Scores

Lecture quizzes are automatically graded in Top Hat and the scores transferred into Canvas at midterm and end of the semester. Recitation quizzes are graded manually by the TA and the scores posted on Canvas within one week. OWL (homework) is automatically graded directly on the OWL site and the scores are synched into Canvas periodically. Errors may occur: OWL may experience a glitch and not import the correct score; a grader may make a grading mistake. If you believe that an error occurred, you must inform the instructor and/or TA immediately, and by one week after the assignment due date. It is the student's responsibility to check grades on Canvas.

Final Grades

Final grades are based solely on graded work and are NOT negotiable; **no single student will be offered make-up assignments, retakes, or extra credit points.**

Visit [ISU Catalog website](#) for the grading policies regarding incomplete marks

ISU Academic Calendar

List important dates (or include a link to the ISU Academic Calendar) such as last drop date, registration dates for the next semester. Visit the ISU Academic Calendar for detailed information

Additional Learner-Centered Information

- **Take time to familiarize yourself** with the course structure and layout in the learning management system being used such as Canvas or other technology used in the course.
- **Read** the essential documents – course syllabus/course schedule.
- **Identify and establish** the **communication channels** provided – Help Forums/online meetings/Email/groups discussion forums
- **Confirm technical requirements** –so that you can access all the materials
- Be patient and **respectful of response time** mentioned.
- **Plan your time** – have a personal schedule, a consistent study time and stay organized. **DO NOT WAIT UNTIL THE LAST MOMENT TO WORK ON YOUR ASSIGNMENTS.**
- **Make connections** with fellow classmates and the instructor.
- **Ask Questions** – Don't wait. Ask questions regarding expectations/content/policies. Follow the mentioned protocols for the course.
- Become familiar with [the way the To Do list works in Canvas](#) to help you stay organized.
- **Log-in to the course at least 3 times** a day.

Supplemental Instruction (SI)

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

Academic Misconduct

All acts of dishonesty in any work constitute academic misconduct. Online courses are no exception. The Student Disciplinary Regulations (<http://policy.iastate.edu/policy/SDR>) will be followed in the event of academic misconduct. Depending on the act, a student could receive an F grade on the test/assignment, F grade for the course, and could be suspended or expelled from the University. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing attempt to help another student commit an act of academic dishonesty. See more information at [Academic/Research Misconduct for Students](#). No matter the allegations, the instructors (TA and professors) are required to submit the case to the Dean of Students Office. Academic dishonesty includes, but is not limited to each of the following acts when performed in any type of academic or academically related matter, exercise, or activity.

Plagiarism

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

Obtaining Unauthorized Information

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

Tendering of Information

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

Misrepresentation

Students misrepresent their work by handing in the work of someone else. The following are examples: purchasing a paper from a term paper service; reproducing another person's paper (even with modifications) and submitting it as their own; having another student do their computer program or having someone else take their exam. Bribery: Offering money or any item or service to a faculty member or any other person to gain academic advantage for yourself or another is dishonest.

Bribery

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

Course-specific information

The following constitutes academic misconduct: copying or sharing answers on tests or assignments, consulting unauthorized resources during tests or assignments (e.g., phone, tablet, computer, notes, book, etc.), plagiarism, sharing the join code (Top Hat) with another student or having another student give you the join code while absent from class, submitting answers on Top Hat while absent from class, sharing answers on Top Hat with students who are not in class, not following the guidelines regarding the cardstock periodic table, and having someone else do your academic work.

University Policies

Accommodations

Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact your instructor to set up a meeting within the first two weeks of the semester or as soon as you become aware of your need. Before meeting with your instructor, you will need to obtain a SAN form with recommendations for accommodations from the [Student Accessibility Services](#) located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7220 or email accessibility@iastate.edu. Retroactive requests for accommodations will not be honored.

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](#) at 515-294-1020 or the [Office of Equal Opportunity](#) at 515-294-7612.

Harassment and Discrimination

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

Accessibility Statement

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, SAS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at www.sas.dso.iastate.edu, by contacting SAS staff by email at accessibility@iastate.edu, or by calling 515-294-7220. Student Accessibility Services is a unit in the Dean of Students Office located at 1076 Student Services Building.

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.

Prep Week

This class follows the Iowa State University Prep Week policy as noted in section 10.6.4 of the [Faculty Handbook](#).