

CHEM 167 | Chemistry for Engineering Students

Prerequisites:

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

Instructor and Contact

Instructor: Vincenzo Venditti. **E-mail:** chem167qv@iastate.edu.

Lecture: 9:55 – 10:45 am MWF in 1001 Troxel Hall.

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

Office Hours

MWF 10:45 am – 11:15am 1110 Troxel Hall or by appointment

Head TA: TBD. **Office Hours:** at Chemistry Help Center.

Email contact: chem167qv@iastate.edu.

Contacting the Instructors/Head TA: We encourage you to contact me 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 24 hours.

- **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.

Course Catalog Description

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

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

Principles of chemistry and properties of matter explained in terms of modern chemical theory with emphasis on topics of general interest to the engineer. Only one of Chem 163, 167, 177, or 201 may count toward graduation. Mention whether the course meets international perspectives requirements.

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 online platform OWL 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 your Learning Management System (Canvas etc.).
3. Access to a computer with a microphone and audio capability.

Required Textbook and Supplies

- Chemistry for Engineering Students, 4th Edition - by Brown and Holme, Cengage.
- OWLv2 online homework.
- This course will use the **Top Hat** response system in class.
- A scientific calculator with basic functions including logarithms and exponential functions.

Visit [Canvas](#) for additional information

Library

To login from off-campus: When you're off ISU campus and would like to access one of ISU's subscription databases or licensed full text resources (such as journal articles, e-books, and journals) from the [Library website](#), you will be prompted to login using the last 11 digits of your ISU University ID (9-digit University ID plus the following 2-digit Security Code) and [the Library password \(Borrower ID password\) you set](#).

Even if you do not have a physical ISUCard, you do have an ISU University ID number. If you don't remember that number, you can login to [AccessPlus](#) using your social security number and verify your University ID number.

Login questions or problems? Contact Circulation Desk staff: Phone (515) 294-3961 or email CircDesk@iastate.edu

See also the Library's [Distance Learning Support](#) guide for more information on access, how to find and search helpful databases, and how to get articles and books you need sent to you.

Assignments

- **Lecture quizzes (Top Hat).** Quizzes will be given during each class 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 DO NOT count towards your final grade.

- **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. To access the list of weekly Homework assignments visit the “eBook and OWL” module on canvas. Homework DO NOT count towards your final grade. However, please note that ***Homework is designed to help you master a topic before we move on to the next topic; thus you are strongly encouraged to complete your assignment by the suggested due date.***
- **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 10% to your final grade.
- **Exams.** There will be 3 hour-exams on Monday September 18, October 16, November 13 during class time. 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 ways; 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 60% to your final grade.
- **Final Exam.** Final examinations will be held during **final week: December 11-14 (Mon-Thur).** The date and time of the CHEM 167 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 December 2 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 30% to your final grade.

Grade Distribution

| Assessments | Percentage |
|--------------------|------------|
| Recitation quizzes | 10% |
| Hour-Exams | 60% |
| Final Exam | 30% |
| 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.
- 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.

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** in a day.

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](#).

Health and Wellness

- **Public Health**

If you are not feeling well, you should 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.

You may choose to wear a face mask and/or receive the COVID-19 vaccine and boosters, as well as other vaccines such as influenza, but those options are not required. Thielen Student Health Center will continue to provide COVID-19 vaccinations free-of-charge to students. The university will continue to offer free masks and COVID-19 test kits during the fall 2022 semester. Other wellbeing resources for students are available at:

<https://www.cyclonehealth.iastate.edu/wellbeing-resources/>

Public health information for the campus community continues to be available on Iowa State's public health website. All public health questions should be directed to publichealthteam@iastate.edu.

- **Iowa State University is committed to proactively facilitating all students' well-being.** We welcome and encourage students to contact the following on-campus services for their physical, intellectual, occupational, spiritual, environmental, financial, social, and/or emotional needs:
 - Student Wellness call 515-294-1099 or via website (<http://studentwellness.iastate.edu>);
 - Thielen Student Health Center call 515-294-5801 (24/7 Medical Advice) or via website (<http://www.cyclonehealth.org>);
 - Student Counseling Services call 515-294-5056 or via website (<https://counseling.iastate.edu>);
 - Recreation Services call 515-294-4980 or via 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 ISU Police Department 515-294-4428.
- **Basic needs.** To learn effectively, you must have basic security: a roof over your head along with a reliable place to sleep and enough food to eat (view the [Food Security at ISU Student Wellness page](#)). If you're having trouble with any of those things, please talk with me or the [Dean of Students Office](#) (email studentassistance@iastate.edu, phone 515-294-1020). Together we can work to meet those needs.
- **Responsible Employee:** Iowa State University is committed to creating an educational, work, living, and campus environment that is free from all forms of sexual harassment, sexual assault, dating violence, domestic violence, stalking, and unlawful discrimination and harassment on the basis of protected class. As a responsible employee, I am responsible for reporting all incidents of prohibited sexual harassment, including sexual assault, stalking, and dating and domestic violence, to the university's Title IX coordinator. Students can choose to discuss their experiences confidentially with the following resources: ACCESS (Assault Care Center Extending Shelter and Support) at 515-292-0500; ISU Student Counseling Services at 515-294-5056; and Thielen Student Health Center at 515-294-5801.
- **Green Dot Project:** A green dot is any choice, behavior, word or attitude that promotes everyone's safety and communicates utter intolerance for power-based personal violence in our

Iowa State University community. A green dot is anything you do to make our community safer. What is your Green Dot? Visit the Green Dot – Student Wellness website (<http://www.studentwellness.iastate.edu/greendot/>).

Canvas for Students at ISU

Getting Started

1. Be sure to have an ISU NetID. If you do not, please visit Passwords and Accounts (<https://www.it.iastate.edu/services/accounts>)
2. Login to [Canvas](#) with your ISU NetID and password and look for your course for this semester.

Canvas Help

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

- [Canvas Live Chat – 24/7 live chat with Canvas specialists](#)
- [Canvas Guides-a repository of how-to's](#)
- [Ask the Canvas Community-Online support forum for canvas users. Log in using ISU credentials.](#)
- ISU Canvas Support Line: Call 515 294 4000, press 2 and then press 1. [Hours of operation.](#)
- Go to [Lynda.com](#) and log in with your ISU credentials. Search for the desired tutorial.

Basic Troubleshooting (if Canvas is not working)

- Username/Password not working?
 - The login information (username and password) for Canvas is the same as for your ISU email account.
 - For help with Username and Password, please visit [University Accounts](#) or contact Solution Center at 515-294-4000 or solution@iastate.edu.
- If you get an error message, check for Browser and Java Issues on your computer.
- If you are unable to access course content or activities (e.g., Tests, Discussions, Assignments, etc.), contact your instructor.
- Check general [Technology Support for Students](#)

Honors

Taking CHEM 167 for Honors Credit

Students wishing to obtain honors credit for CHEM 167 must register on the University Honors Program website and send an email to Dr. Cristina Bonaccorsi (chem167qb@iastate.edu) immediately after registering.

Students will be invited to join a **Canvas Course** called **CHEM 167 Honors**. This is an “organization” course, which means it will not appear on your transcript. You will use it to fulfill the requirements (see below) and I will use it to evaluate if you fulfilled the requirements.

Chem 167 – Section 1, Recitation Sections 1 – 17

Tentative Schedule of Events

Fall 2022

| Week | Dates | Chapter/Topics | Exams |
|------|----------------------|--|--|
| 1 | Aug 21 – 25 | 1 - Introduction to Chemistry 2 - Atoms and Molecules | |
| 2 | Aug 28 – Sep 1 | 3 - Molecules, Moles, and Chemical Equations | |
| 3 | Sep 4 – 8 | 4 - Stoichiometry | Sep 4, Labor Day no classes |
| 4 | Sep 11 – 15 | 4 - Stoichiometry (cont.) and 5 - Gases | |
| 5 | Sep 18 – 22 | 5 - Gases (cont.) | Exam I: Mon, Sep 18 |
| 6 | Sep 25 – 29 | 6 – The Periodic Table and Atomic Structure | |
| 7 | Oct 2 – 6 | 7 - Chemical Bonding and Molecular Structure | |
| 8 | Oct 9 – 13 | 7 - Chemical Bonding and Molecular Structure (cont.) and 8 - Molecules and Materials | |
| 9 | Oct 16 – 20 | 8 - Molecules and Materials (cont.) | Exam II: Mon, Oct 16 |
| 10 | Oct 23 – 27 | 9 - Energy and Chemistry | |
| | Fri Oct 27 | <i>Last day to drop the course without extenuating circumstances.</i> | |
| 11 | Oct 30 – Nov 3 | 10 - Entropy and the Second Law of Thermodynamics | |
| 12 | Nov 6 – 10 | 11 - Chemical Kinetics | |
| 13 | Nov 13 – 17 | 11 - Chemical Kinetics (cont.) and 12 – Chemical Equilibrium | Exam III: Mon, Nov 13 |
| | Nov 20 – 24 | Thanksgiving break – NO CLASSES!!!!!! | |
| 14 | Nov 27 – Dec 1 | 12 - Chemical Equilibrium (cont.) | |
| | Friday Dec 1 5 pm | <i>Last day to request a change in final exam schedule, see http://www.registrar.iastate.edu/students/exams for details.</i> | |
| 15 | Dec 4 – 8 | 13 - Electrochemistry | |
| 16 | Dec 11 – 14 | Finals Week The date of our final exam will be released by the registrar; http://www.registrar.iastate.edu/students/exams/fallexams | Final Exam TBD |