

Chem 178: General Chemistry II
Spring Semester 2023
Monday and Wednesday 1:10–2:00 pm
Troxel Hall: 1001

Instructor

Dr. Alexander Gundlach-Graham

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Regular Office Hours*: Mon. 2:30–3:30 pm, Wed. 2:30-3:30 pm

**Office Hours by appointment may be setup via email; each student requesting a meeting should do so at least 24 hours in advance and provide two scheduling options.*

Head Teaching Assistant (TA)

Name: Tristen Taylor

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Canvas Page: <https://canvas.iastate.edu/courses/96532>

Course Description

(3-0) Cr. 3. F.S.SS.

Prerequisites: CHEM 177, CHEM 177L, or CHEM 167

Chem 178 is the second semester of a full-year rigorous introduction to fundamental principles of chemistry. It is a continuation of Chem177. Recommended for physical or biological science majors, chemical engineering majors, and all others intending to take 300-level chemistry courses.

Learning Objectives and Outcomes

By completing this course, students will be able to:

- use the language of chemistry: symbolic representation, nomenclature, and terminology.
- represent any chemical process using a balanced chemical equation.
- recognize kinetic and thermodynamic features of chemical reactions.
- evaluate the important characteristics of chemical and physical equilibria.
- recognize acid-base and reduction-oxidation (redox) reactions.
- solve quantitative problems related to chemical kinetics, equilibria, electrochemistry, enthalpy, entropy, and free-energy
- understand nuclear structure of atoms and nuclear decay reactions.

Resources and academic support

The department of chemistry provides help to all general chemistry students in the **Martha E. Russell Chemistry Help Center** in 1761 Gilman Hall. It is open MTWR from 9 am to 5 pm and Fridays from 9 am to 1 pm. The Help Center is staffed by general chemistry teaching assistants. Solutions manuals and general chemistry textbooks, study guides, and workbooks are available. Resources in the Help Center may not be removed from the room. Students are encouraged to form study groups and meet on a regular basis.

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.

Required Course Content and Supplies

- Scientific calculator with basic functions including logarithms and exponential functions
- Digital Course Content (details below)
- Top Hat (details below)
- Device (laptop, tablet, smart phone) with internet access for Top Hat

Digital Course Content (Includes E-Textbook)*

Title: OWLv2 with MindTap Reader for Zumdahl/Zumdahl/DeCoste's, *Chemistry, Tenth Edition*

Author: Steven S. Zumdahl; Susan A. Zumdahl; Donald J. DeCoste

Publisher: Cengage

ISBN: 978-1-305-95757-2

Price to Student: \$47.00

Duration: 180 days

* This course is enrolled in the **ISU Immediate Access Program**, which means that students will automatically receive access to all required digital course materials the first day of class. Students will be charged on their U-bill for the digital content. The billing description on your U-bill will appear as CHEM 178 IMMED ACCESS 7572. The digital content is required to complete online homework assignments and includes access to the eBook. Students who drop the course within the first 10 days of class will receive a refund on their U-bill. Students do not have to notify the bookstore if they drop the course; this is an automated process.

Access to Cengage Learning's OWLv2 courseware is required to complete online homework for this course. Instructions for accessing OWLv2 are provided on the Course's Canvas site in the module "**E-Textbook and OWL HW System Information**"

Top Hat License

This course will use the Top Hat response system in class and requires the purchase of a license to participate. 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. You will need to purchase a Top Hat license from the Iowa State University Book Store or through the [Top Hat website](#) before you will be able to access the Top Hat course materials. By ordering through the ISU Book Store you can use your Student Financial Aid account (U-Bill) to purchase the license(s). Further instructions on access to Top Hat are provided on Canvas.

Join Code: 268912

Course Design and Assignments

A detailed outline of all graded assignments is provided on the Home page of our Canvas site under the "Course Summary" heading." A detailed outline of all assignments is also provided in the "Course Schedule" document provided on the Canvas home page, accessible via the "Syllabus and Schedule" button.

Canvas and Course Topics. The material covered in the course is broken down into six topics, which are discussed in seven chapters in the textbook. Each course topic will be covered within about 2 weeks. In Canvas, readings, power point slides, and links to OWL homework assignments, will be posted in modules for each course Topic. The six topics are:

- Topic 1: Chemical Kinetics
- Topic 2: Chemical Equilibria
- Topic 3: Acid-Base Equilibria
- Topic 4: Aqueous Equilibria
- Topic 5: Chemical Thermodynamics
- Topic 6: Electrochemistry
- Topic 7: Nuclear Chemistry

Lectures. You are expected to attend classes and to have completed assigned readings before lecture. You will learn more by coming to lecture prepared. Top Hat quizzes will be used in class to record attendance, which will account for 5% of your overall grade, as discussed in the grading section below.

Please refrain from any disruptive activities in the classroom, which might affect other students or distract the instructor. This includes reading newspapers, browsing the internet, playing games, watching videos, talking, etc. Research studies have shown a clear correlation between the use of laptops for entertainment in large lecture settings and LOWER student learning in the lecture environment; students around a laptop user also pay less attention to the content of the lecture. ***Your instructors and classmates are permitted and encouraged to ask you to discontinue distracting behavior. To help promote a good learning environment for all, please be respectful in your behavior toward your fellow students and your instructors.***

Top Hat will be used to collect attendance at lectures. Bring your device to all lectures; failure to bring a device to class will result in 0 points for that day; ***no exceptions.*** Sharing the attendance code with classmates who are absent from class, having a classmate give you the attendance code while you are absent from class, submitting answers while absent from class, sharing answers with students who are not in class, etc. constitute academic misconduct.

Recitations. You are expected to attend your assigned recitation section each Friday. At recitations, TAs will work through example problems and/or present additional material. Recitations are an excellent opportunity to get any questions you might have about course material clarified. Each recitation period, a worksheet covering material pertinent to that week's content will be handed out. You may only get this worksheet at your recitation session. At the discretion of the TA, this worksheet will be completed in groups of 2-3 during the recitation period. At the end of the period, the worksheet will be turned in and graded. There will be a total of 14 graded worksheets (no worksheet during week 1). Your top 10 worksheet scores will count toward your final grade.

OWLv2 Homework. All graded homework will be given through Cengage Learning's OWLv2 platform. Links to homework assignments are found within each course Topic module on Canvas. There will be 11 OWL assignments throughout the semester. These assignments will be due by Friday at 11:59 p.m. of the assigned weeks. All weeks without an exam will have an OWL assignment due. OWL assignments are a great way to learn the material for this course because it facilitates learning by practice.

Exams. In addition to the Final Exam, three one-hour exams are scheduled for in-class on **Feb. 20, March 27, and April 26. There are no make-up exams.** If you have a valid reason to miss an hour exam, you must immediately contact the instructor. In addition to in-class portions of the semester exams, an online portion of the exam (administered through canvas) may also be assigned. Details will be provided by the instructor. You will be asked to drop the course if you miss more than one exam. An early exam will be scheduled for those students having a valid conflict with the exam. Athletes and students who are away from campus for ISU games, matches, or club trips may request alternate arrangements for taking the exam. However, course policies and rules will prevail. **No cell phones or other personal devices with access to the internet may be used during exams.**

Exams will be in multiple-choice format and are machine graded. It is important to bubble in your username correctly on the bubble sheet; the minimum consequence is the loss of 4 points on the exam; a greater risk is the loss of the entire exam score should we be unable to identify your exam.

Final exam. The date and time of the final exam is **Tuesday, May 9 at 12:00 p.m. (noon).** 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 28.** The ISU final examinations policy will be followed:

<https://www.registrar.iastate.edu/students/exams>

Grading

There will be five types of graded assessments in this course: Class Participation (TopHat Polls) Recitation Quizzes, OWLv2 Homework Assignments, Semester Exams, and the cumulative Final Exam. Each of these assessment types will account for a percentage of your overall grade as elaborated in the table below:

Assessment Categories	Percent Contribution
Class Participation (Top Hat)	5%
Recitation Worksheets	15%
OWLv2 HW Assignments	20%
Three Semester Exams	45%
Final Exam	15%
Total	100%

Grade Distribution

Grades for each assessment category are based on the percent contribution of that category to the overall course grade. The absolute number of points in each assessment category does not affect the weight of grades from that category on the final grade. However, point values within each category do affect total score in that category. For example, longer OWL assignments are worth more than shorter assignments.

Letter Grading Scale*

<u>Letter Grade*</u>	<u>% Range</u>
A	93 - 100
A-	90 - < 93
B+	87 - < 90
B	83 - < 87
B-	80 - < 83
C+	77 - < 80
C	73 - < 77
C-	70 - < 73
D+	67 - < 70
D	63 - < 67
D-	60 - < 63
F	< 60

*+ and - (plus and minus) grade division are tentative; exact grade division thresholds will be informed by overall class performance and so will be established at the end of the semester. Final grades are based solely on graded work and are NOT negotiable; no single student will be offered make-up or extra credit points.

Late Assignments and Exams

- Top Hat responses cannot be made up.
- Late submissions for OWL HW assignments are accepted with 10% penalty.
- There will be no make-up recitation worksheets; you must attend recitation section to obtain the worksheet. The lowest
- **There are no make-up exams.** If you have a valid reason to **miss an exam**, you must contact the instructor **one week in advance** to arrange an alternative. If you have extraordinary circumstances that prevent you from completing an exam, please contact the instructor as soon as possible.

University Policies

Students in this course are responsible for being familiar with the University's student rules and policies. Please see the "Syllabus Statements" section of the course's Canvas site.