

**CHEMISTRY 325**  
**CHEMICAL THERMODYNAMICS**

**GENERAL INFORMATION**

Instructor: **Wenyu Huang**, 2124 Hach, Ph: 4-7084, e-mail: [whuang@iastate.edu](mailto:whuang@iastate.edu)

Section 1: **M W F 08:50-09:40am Gilman 2354**

Office Hours: **T Th 10:00-11:00** (appointment preferred, but not required).

Teaching assistant: **Simin Sun**, 2255 Hach Hall, e-mail: [simins@iastate.edu](mailto:simins@iastate.edu)

Office Hours: **T Th 4:00-5:00 pm**.

**LEARNING OUTCOMES**

By the end of this course students can apply thermodynamics and chemical equilibrium concepts in their professional lives.

**LEARNING OBJECTIVES**

- Understanding the concepts of 1st, 2nd, and 3rd law of thermodynamics, and applying them to solve problems that may be encountered in their professional lives.
- Understanding the concepts of chemical equilibrium, and applying them to solve problems related to chemical reactions and phase transformations of materials.

**TEXT BOOK**

McQuarrie & Simon, Molecular Thermodynamics, 1999, University Science Books, in bookstore.

Class notes will generally be posted on Canvas. You are welcome to download and print them.

**GRADING**

Homework & Quizzes	~30%
First Exam	~15%
Second Exam	~15%
Third Exam	~15%
Final Exam	~25%

A nonprogrammable scientific calculator is required for the exams. The grading system will be used. Grades will be assigned based on the normal curve using the total number of points accumulated. Examples of the grading curve will be given after each exam. One-week notice will be given for exams. The final exam will be given in the scheduled period during finals week. Graduating seniors must take the final exam.

**TENTATIVE CLASS SCHEDULE**

Lectures 1-11 Ch. 2/5/D/C/E

Lectures 12-13 QM review  
Lectures 14-16 Ch. 3  
Lectures 17-18 Ch. 4  
Lectures 19-22 Ch. 6  
Lectures 23-24 Ch. 7  
Lectures 25-27 Ch. 8  
Lectures 28-30 Ch. 9  
Lectures 31-34 Ch. 10  
Lectures 35-36 Ch. 11  
Lectures 37-39 Ch. 12  
Lectures 40-41 Review  
(a more detailed schedule is available on Canvas)

## COURSE POLICIES

**Academic Dishonesty.** The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the [Dean of Students Office](https://www.studentconduct.dso.iastate.edu/academic-misconduct) (<https://www.studentconduct.dso.iastate.edu/academic-misconduct>).

**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](http://www.sas.dso.iastate.edu), by contacting SAS staff by email at [accessibility@iastate.edu](mailto: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.

### Disclaimer about Freedom of Speech and Academic Freedom

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](https://www.provost.iastate.edu/faculty-and-staff-resources/faculty-handbook), (<https://www.provost.iastate.edu/faculty-and-staff-resources/faculty-handbook>).

**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)

**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/) (<https://www.studentassistance.dso.iastate.edu/>) at 515-294-1020 or the [Office of Equal Opportunity](https://www.eoc.iastate.edu/), (<https://www.eoc.iastate.edu/>) at 515-294-7612.

**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)

#### **ADDRESS STUDENTS WITH SPECIAL NEEDS**

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. All students requesting accommodations are required to meet with staff in Student Disability Resources (SDR) to establish eligibility. A Student Academic Accommodation Request (SAAR) form will be provided to eligible students. The provision of reasonable accommodations in this course will be arranged after timely delivery of the SAAR form to the instructor. Students are encouraged to deliver completed SAAR forms as early in the semester as possible. SDR, a unit in the Dean of Students Office, is located in room 1076, Student Services Building or online at [www.dso.iastate.edu/dr/](http://www.dso.iastate.edu/dr/). Contact SDR by e-mail at [disabilityresources@iastate.edu](mailto:disabilityresources@iastate.edu) or by phone at 515-294-7220 for additional information.

**RELATED TO ISU'S PRINCIPLES OF COMMUNITY:** Students are responsible for living the tenets established in ISU's Principles of Community: Respect, Purpose, Cooperation, Richness of Diversity, Freedom from discrimination, and the Honest and respectful expression of ideas. Visit [ISU's Principles of Community](http://www.diversity.iastate.edu/principles-of-community) website (<http://www.diversity.iastate.edu/principles-of-community>)

**REGARDING A STUDENT'S 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 accordingly early in the semester so that I may make appropriate changes to my records.

**SUPPORTING STUDENT HEALTH AND WELLNESS:** 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.

**FOSTERING A SAFE COMMUNITY:**

**Green Dot Project:** A green dot is any choice, behavior, word or attitude that promotes safety for everyone 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](http://www.studentwellness.iastate.edu/greendot/) website (<http://www.studentwellness.iastate.edu/greendot/>).

**Title IX Reporting Responsibilities:** [Download Equal Opportunity’s Sample Syllabi Language for Title IX Regarding Reporting Responsibilities \(PDF\)](https://www.eoc.iastate.edu/sites/default/files/uploads/Sample%20TIX%20Syllabi%20Language.pdf). (<https://www.eoc.iastate.edu/sites/default/files/uploads/Sample%20TIX%20Syllabi%20Language.pdf>)

**ABOUT MUTUAL RESPECT AND PROFESSIONALISM:** You are expected to treat your instructor and all other participants in the course with courtesy and respect. Your comments to others should be factual, constructive, and free from harassing statements. You are encouraged to disagree with other students, but such disagreements need to be based upon facts and documentation (rather than prejudices and personalities). 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. It is preferable if students discuss issues directly with the instructor, however, students may also leave a note in the instructor’s mailbox.

**RELEVANT TO THE ISU INCLUSIVE LANGUAGE POLICY:** All university publications and communication, whether oral or written, shall use inclusive language and illustrations. Inclusive language refers to language that makes every attempt to include comprehensively all groups in the community. Whenever possible, selection of academic materials will also reflect efforts to uphold this university policy.” Visit the [Policy Library’s Inclusive Language](#) website.

**RELATED TO 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.

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**TENTATIVE SCHEDULE**

Date of revision: August 19, 2024

Week	Lecture	Date	Week Day	Chem 325 Topic/ Activity
1	1	Aug. 26	M	Lecture: Ch. 2/5/C/D/E
	2	Aug. 28	W	Lecture: Ch. 2/5/C/D/E
	3	Aug. 30	F	Lecture: Ch. 2/5/C/D/E
2		<b>Sep. 2</b>	<b>M</b>	<i>No class, University holiday</i>
	4	Sep. 4	W	Lecture: Ch. 2/5/C/D/E
	5	Sep. 6	F	Lecture: Ch. 2/5/C/D/E <i>First homework set is due today</i>
3	6	Sep. 9	M	Lecture: Ch. 2/5/C/D/E
	7	Sep. 11	W	Lecture: Ch. 2/5/C/D/E
	8	Sep. 13	F	Lecture: Ch. 2/5/C/D/E <i>Second homework is due today</i>
4	9	Sep. 16	M	Lecture: Ch. 2/5/C/D/E
	10	Sep. 18	W	Lecture: Ch. 2/5/C/D/E
	11	Sep. 20	F	Lecture: Ch. 2/5/C/D/E <i>Third homework is due today</i>
5	12	Sep. 23	M	Lecture: QM review
	13	Sep. 25	W	Lecture: QM review
		<b>Sep. 27</b>	<b>F</b>	<i>First Exam: Ch. 2, 5, and parts of C, D, &amp; E</i>
6	14	Sep. 30	M	Lecture: Ch. 3
	15	Oct. 2	W	Lecture: Ch. 3
	16	Oct. 4	F	Lecture: Ch. 3 <i>Fourth homework is due today</i>
7	17	Oct. 7	M	Lecture: Ch. 4
	18	Oct. 9	W	Lecture: Ch. 4
	19	Oct. 11	F	Lecture: Ch. 6 <i>Fifth homework is due today</i>
8	20	Oct. 14	M	Lecture: Ch. 6
	21	Oct. 16	W	Lecture: Ch. 6
		<b>Oct. 18</b>	<b>F</b>	<i>Second Exam: Quantum mechanics, Ch. 3 &amp; 4 (Mid-term grades due)</i>
9	22	Oct. 21	M	Lecture: Ch. 6
	23	Oct. 23	W	Lecture: Ch. 7
	24	Oct. 25	F	Lecture: Ch. 7 <i>Sixth homework is due today</i>

Week	Lecture	Date	Week Day	Chem 325 Topic/ Activity
10	25	Oct. 28	M	Lecture: Ch. 8
	26	Oct. 30	W	Lecture: Ch. 8
	27	Nov. 1	F	Lecture: Ch. 8 <b>Homework set #7 due today</b> <b>(Drop deadline)</b>
11	28	Nov. 4	M	Lecture: Ch. 9
	29	Nov. 6	W	Lecture: Ch. 9
	30	Nov. 8	F	Lecture: Ch. 9 <b>Homework set #8 due today</b>
12	31	Nov. 11	M	Lecture: Ch. 10
	32	Nov. 13	W	Lecture: Review for Exam III
		Nov. 15	F	<b>Third Exam: Ch. 6, 7, 8, 9</b>
13	33	Nov. 18	M	Lecture: Ch. 10
	34	Nov. 20	W	Lecture: Ch. 10
	35	Nov. 22	F	Lecture: Ch. 11 <b>Homework set #9 due today</b>
14		Nov. 25 - 29		<b>Fall Break</b>
15	36	Dec. 2	M	Lecture: Ch. 11
	37	Dec. 4	W	Lecture: Ch. 12
	38	Dec. 6	F	Lecture: Ch. 12
16	39	Dec. 9	M	Lecture: Ch. 12
	40	Dec. 11	M	Review
	41	Dec. 13	M	Review
17		Dec. 17	Tue. (7:30-9:30 am)	<b>Final Exam (cumulative)</b>