



Oregon State University
Ecampus

Course Name: Physical Chemistry

Course Number: CH440

Credits: 3

Instructor name: Jie Zhang

Instructor email: zhangji@oregonstate.edu

Course Description

Thermodynamics, electrochemistry, solutions, kinetic theory of gases, chemical kinetics, quantum theory and statistical mechanics, molecular structure and spectroscopy.

Prerequisites:

One year of college chemistry, one year of college physics and MTH254 (vector calculus) – GRADES HAVE TO BE ABOVE D- IN ALL PREREQUISITE CLASSES. If you discover your deficiency in these subjects, early intervention is necessary to pass the class.

To review, Appendix D.0 – D.3, and D.5 of textbook.

Communication

Please post all course-related questions in the Q&A Discussion Forum so that the whole class may benefit from our conversation.

Ways of communication:

Email, Zoom meeting (by appointment)

It is critically important that you check your OSU email account **at least once a day**. All Announcements posted on Canvas are immediately sent to your OSU email account, unless you have changed the setting in your Canvas account to have them sent less frequently. We would suggest NOT doing this as we will assume that everyone has seen announcements within 24 hours of our posting the announcement.

Please contact me privately for matters of a personal nature. I will reply to course-related questions within 24 hours. I will strive to return your assignments and grades for course activities to you within 2 days of the due date.

Course Credits

This course combines approximately 90 hours (9 hours per week) of instruction, online activities, and assignments for 3 credits.

Course Content

Textbook:

Physical chemistry 4th edition

by Robert A. Alberty and Robert Silbey

ISBN: 978-0-471-21504-2

Week	Topic	Reading Assignments	Learning Activities	Due dates
0	CH 1: 0 th Law & Eq. of State	1.1-1.5, 1.7,1.8,1.11	Syllabus quiz, HW1	09/27
1	CH 2: 1 st Law	2.1,2.2,2.4-2.8,	HW2, Quiz 1	10/04
2	CH 2: 1 st Law	2.9-2.13	HW3, Quiz 2	10/11
3	CH 3: 2 nd Law	2.3,3.1-3.4	Quest 1	10/15
4	CH 3: 2 nd Law	3.5-3.9	HW4, Quiz 3	10/25
5	CH 3: 2 nd & 3 rd Law	3.5-3.9	Quest 2	10/29
6	CH 4: Fund Eq.	4.1,4.2,4.9	HW5, Quiz 4	11/08
7	CH 4: Fund Eq.	4.4-4.7	Quiz 5	11/15
8	CH 5: Chem. Equilibrium	4.3,5.1-5.6	HW6, Quest 3	11/22, 11/19
9	CH 6: Phase Eqm	1.9,5.9,6.1-6.3	HW7, Quiz 6	11/29
10	CH 6: Phase Eqm	6.4-6.8	HW8, Quiz 7	12/05
Finals	Cumulative		Quest 4	

Measurable Student Learning Outcomes

For CH440, students should be able to

1. conduct calculations involving the First and Second Laws of Thermodynamics,
2. derive the differential identities linking thermodynamic quantities,
3. express thermodynamics properties in power series
4. calculate equilibrium constants of chemical reactions from thermodynamic properties,
5. identify physical and chemical properties from phase diagrams
6. calculate phase diagrams from thermodynamic properties

Evaluation of Student Performance

Assignment	Points
Quests	200 (50×4)
Weekly Quizzes	105 (15×7)
Homework	28 (4×7)
Self-Grading Assignment	24 (4×6)
Discussion	7 (1×7)
TOTAL	364

Extra credits:

The total extra credits will max out at 25 points.

1. Two short essays (one or two paragraphs) for 5 points each.
2. Weekly discussion on comment and answering peer's post, 1 point for each week with maximum 9 points.
3. Weekly share of lecture notes and concept maps, 1 point for each week with maximum 10 points.
4. Point out mistake or errors in learning material, 1 point for each find (Has to be posted on the general discussion board).

After each assignment, students have **One week** to correct grading errors.

Students are expected to have checked the key and be ready to defend his/her logic without any assistance. Partial credits can go up and down depending on the presentation of logic.

Homework and Self-grading Assignment:

- All Problem Sets are **due on Monday 11:59 pm** of the week. Self-grading for the corresponding problem set is due on **Thursday**. Check Canvas for updates of deadlines.
- Homework and self-grading must be written or typed **LEGIBLY**, and problems are solved in the listed ORDER (from low to high in number). **Clear pictures** of your HW should be uploaded before the deadline listed in Canvas. The Instructor/TAs have the liberty of not giving out any credit for poor quality images, illegible handwriting, and misordered problem sets.
- There are 8 problem sets to be turned in, and at the end of the term, the set with the lowest score will be dropped. The keys will be posted right after the due time. Grading is only based on the quality of effort on a 4 point scale for each set: 0 points for no submission, and 4 points for complete work, and the rest is at the Instructor/TA's discretion.
- After key is posted on Canvas, student will pick 2 problems to grade based on the rubrics provided. There will be 8 self-grading assignments and the lowest score can be dropped. Grading is only based on the quality of effort on a 4 point scale for each set: 0 points for no submission, and 4 points for complete work, and the rest is at the Instructor/TA's discretion.
- Policy on plagiarism for turned in homework sets:
 - Homework copied from "solutions manual": if there is any sign of such a behavior, all points from homework will be wiped out.
 - Homework copied from other students: everybody in the group shares the total points of that problem set. For example, if two people have an identical answer (including all details) to one problem in a problem set, and all problems are answered right, each student receives 50% of the total point of the whole set.

Quests and quizzes:

- Syllabus Quiz – this is the only quiz that you can take repetitively without any penalty.

- Weekly Quizzes – 30 minutes, 2 - 3 question quizzes covering all concepts to date, but mainly focused on concepts from the previous seven days. These quizzes are due at the same time as the corresponding homework set. The first time a student takes the quiz, the **total points are 15**. The second time the student take the quiz, it will be a different quiz and there is a **10% penalty**, meaning that a full core is 7 points. The third time the **penalty is 20%**. Your weekly quiz score is the highest amongst all the quizzes you have taken for the week. Your lowest weekly quiz score will be automatically dropped.
- Quets – Longer than a typical quiz (50 minutes, 4 - 5 questions) but not quite a “Test”, quets will draw from all the concepts learned up to that point. There will be four equally weighted quets. These will be set in weeks 3, 5, and 8, as well as during the final exam period. The format and policies will be the same as weekly quizzes (see below), but they will be worth more points. You cannot drop a Quest score!
- **Policies:**
 - Quizzes/Quets will not be proctored.
 - Quizzes/Quets are open-book. However, you will NOT have enough time to learn things as you go. We recommend making a quick-reference study sheet or note card of important equations and/or concepts as you study. BEWARE: if you use a study sheet from another student, you probably won’t understand what they wrote, it will likely not be helpful, and if they made any errors, it will be harmful.
 - Working together: There is no possible way for us to police whether you are working together or in the same space, and therefore it is not forbidden. **However**, if we suspect that you have been having someone else complete your quiz or part of your quiz for you, or that you have been copying from another student, we will require that you take a video-proctored version of quizzes for the remainder of the term. Note that most of the questions are unique to a particular student. We do not believe students would benefit from working together.
 - Chegg or other similar “homework help” websites: We have a strict NO CHEGG (or other similar sites) policy. When you send someone your quiz question and they send you an answer that is cheating. We have learned how to find quiz or test questions on Chegg and how to figure out who posted them. If it is concluded that you posted a question on Chegg, you will receive a zero on the assignment, and you will not be allowed to drop that score. Additionally, you will have an Academic Dishonesty report on file with the University. Please note, we have been informed that often, medical schools, etc. will specifically ask OSU whether a student has a report on file. If you have had more than one infraction, further actions will be pursued, in cooperation with the Dean.
 - Quizzes are timed, and you will only have access to one question at a time. After you submit the answer to a question, you will not be able to go back and change your answer. WE KNOW that this goes against usual test-taking strategies. However, this is the only way to ensure quiz integrity, and after multiple data points, we have found that average quiz scores did NOT go down when this policy was implemented. (In fact, averages have been the same or gone up!).
 - You are responsible for the security of your Canvas account. Do not give other students your password, leave your computer open in public areas, etc. If you believe your account has been compromised, you are responsible for taking care of the problem immediately.

- You are not allowed to use a VPN in completion of your coursework. (Contact me in the week 1 if VPN is absolutely necessary to connect to Canvas)
- The lowest score from the 8 quizzes will be dropped in the final point calculation.

Office hours

Instructor TA hours: Thursday 2:00-3:00pm

Zoom link will be provided on Canvas

Additional office hours before mid-term and final exam will be announced on Canvas.

If none of the time works for you, you can schedule zoom meetings with instructor (zhangji@oregonstate.edu) by appointment.

Letter Grade

Grade	Percent Range
A	90-100
A-	87-89
B+	84-86
B	80-83
B-	76-79
C+	72-75
C	68-71
C-	65-67
D+	62-64
D	58-61
D-	50-57
F	<49

Makeup Exams

If you have emergency please contact me immediately before the due time so I can rearrange it accordingly. All students are required to participate in all quizzes and quests. Excused absences will generally not be given after the absence has occurred, except under very unusual circumstances.

Technical Assistance

If you experience any errors or problems while in your online course, contact 24-7 Canvas Support through the Help link within Canvas. If you experience computer difficulties, need help downloading a browser or plug-in, or need assistance logging into a course, contact the IS Service Desk for assistance. You can call (541) 737-8787 or visit the [IS Service Desk](#) online.

Learning Resources

Textbook: Physical Chemistry, 4th edition by Silbey, Alberty and Bawendi

Note to prospective students: Please check with the OSU Beaver Store for up-to-date information for the term you enroll ([OSU Beaver Store website](#) or 800-595-0357). If you purchase course materials from other sources, be very careful to obtain the correct ISBN.

Discussion Participation

Students are expected to participate in all graded discussions. While there is great flexibility in online courses, this is not a self-paced course. Participation in discussion is highly recommended throughout the term.

Incompletes

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of your child), and if the student has turned in 80% of the points possible (in other words, usually everything but the final paper). If you are having any difficulty that might prevent you completing the coursework, please don't wait until the end of the term; let me know right away.

Guidelines for a Productive and Effective Online Classroom

Students are expected to conduct themselves in the course (e.g., on discussion boards, email) in compliance with the university's regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

Active interaction with peers and your instructor is essential to success in this online course, paying particular attention to the following:

- Unless indicated otherwise, please complete the readings and view other instructional materials for each week before participating in the discussion board.
- Read your posts carefully before submitting them.
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

Expectations for Student Conduct

This course is offered through Oregon State University Extended Campus. For more information visit: <http://ecampus.oregonstate.edu>.

Student conduct is governed by the university's policies, as explained in the [Student Conduct Code](#). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

Academic Integrity

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Student Conduct and Community Standards](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

- a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.
- b) It includes:
 - i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.
 - ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.
 - iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).
 - iv) TAMPERING - altering or interfering with evaluation instruments or documents.
 - v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.
- c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

TurnItIn

Your instructor may ask you to submit one or more of your writings to Turnitin, a plagiarism prevention service. Your assignment content will be checked for potential plagiarism against Internet sources, academic journal articles, and the papers of other OSU students, for common or borrowed content. Turnitin generates a report that highlights any potentially unoriginal text in your paper. The report may be submitted directly to your instructor or your instructor may elect to have you submit initial drafts through Turnitin, and you will receive the report allowing you the opportunity to make adjustments and ensure that all source material has been properly cited. Papers you submit through Turnitin for this or any class will be added to the OSU Turnitin database and may be checked against other OSU paper submissions. You will retain all rights to your written work. For further information, visit [Academic Integrity for Students: Turnitin – What is it?](#)

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval, please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Accessibility of Course Materials

All materials used in this course are accessible. If you require accommodations please contact [Disability Access Services \(DAS\)](#).

Additionally, Canvas, the learning management system through which this course is offered, provides a [vendor statement](#) certifying how the platform is accessible to students with disabilities.

Tutoring and Writing Assistance

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing suite where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Canvas class by clicking on the Tools button in your course menu.

The Oregon State [Online Writing Suite](#) is also available for students enrolled in Ecampus courses.

Ecampus Reach Out for Success

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an

instructor or academic advisor. Learn about [resources that assist with wellness and academic success](#).

Ecampus students are always encouraged to discuss issues that impact your academic success with the [Ecampus Success Team](#). Email ecampus.success@oregonstate.edu to identify strategies and resources that can support you in your educational goals.

For mental health:

Learn about [counseling and psychological resources for Ecampus students](#). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

For financial hardship:

Any student whose academic performance is impacted due to financial stress or the inability to afford groceries, housing, and other necessities for any reason is urged to contact the Director of Care for support (studentassistance@oregonstate.edu or 541-737-8748).

Student Evaluation of Courses

During Fall, Winter, and Spring term The online Student Evaluation of Teaching system opens to students the Wednesday of week 8 and closes the Sunday before Finals Week. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the hybrid learning experience for future students. Responses are anonymous (unless a student chooses to "sign" their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.