

PHYSICAL CHEMISTRY I

CHEM 3423

SEC 001

SPRING SEMESTER 2026

Instructor: Dr. Ulrich H.E. Hansmann

E-mail: uhansmann@ou.edu (Include “CHEM3423” in the subject-line of your email and address me as “Dr. Hansmann”. Let me know how you would like to be addressed in my reply. Emails will only be answered weekdays between 9AM-5PM.)

Office: Stephenson Life Sciences Research Center 3040

Lectures: *TR 9:00 am – 10:15 am, Dale Hall 0206*

Office Hours: *R 11:00 am – 12:00 pm (SLSRC 3040); and by appointment*

***** Office hours are NOT for solving homework problems or tutoring *****

Online Course Management: <http://canvas.ou.edu>

Online Course Materials: <http://www.hansmann-lab.com/cbpc/hansmann/3423s.php>

Course Description: Thermodynamics, Chemical and Phase Equilibrium, Chemical Kinetics

Required Textbook: “Physical Chemistry”, Fourth Edition, by Laidler, Meiser, and Sanctuary

Reference Textbook: “Physical Chemistry”, Ninth Edition, by Atkins and de Paula

Lecture Schedule (tentative):

Chapter 1: The Nature of Physical Chemistry and the Kinetic Theory of Gases.

Jan. 20, 22, 27 (WS), 29, Feb. 3 (WS),

Chapter 2: The First Law of Thermodynamics.

Feb. 5, 10 (WS), 12, 17 (WS)

Chapter 3: The Second and Third Laws of Thermodynamics.

Feb. 19, 24 (WS), 26, March 3 (WS)

Exam 1: Chapter 1 – 3 (March 5, Thursday, 9:00am-10:15 am; Dale Hall 0206

Chapter 4: Chemical Equilibrium.

March 10, 12, 24 (WS), 26

Chapter 5: Phases

March 31(WS), April 2

Chapter 6: Phase Equilibrium.

April 7 (WS), 9, 14

Exam 2: Chapter 4, 5, 6 (April 16, Thursday, 9:00am – 10:15 am; Dale Hall 0206)

Chapter 9: Chemical kinetics I.

April 21, 23, 28 (WS), 30

Chapter 10: Chemical kinetics II.

May 5 (WS), 7

Final: Chapter 1, 2, 3, 4, 5, 6, 9, 10 (Friday, May 15, 8:00 – 10:00 am; Dale 0206

Course Grading Scheme:

1. Homework Assignments (0%): Problem sets will be assigned weekly on the course web-site. It is essential that you work all of these problems and understand the course material at a satisfactory level. The problems encountered in the homework assignments will be of comparable difficulty as the problems encountered in the quizzes and examinations. On occasion, a problem from homework assignments may be used in exams with minor numerical changes. Homework assignments will **not** be corrected, discussed in class, or graded, but *solutions to the homework problems will be posted on the course web-site (not Canvas)*.

2. Worksheets (24%): A 10-minute worksheet will be handed out on most Tuesdays at the beginning of the class. Unless instructed otherwise, you are only allowed to use the information provided on the worksheet. You must bring your own (non-programmable) calculator. **I encourage you to discuss the problems in small groups, but you have to turn in the sheets individually, and the sheets will be graded individually.** Only the top **EIGHT** out of ten to twelve worksheets will be used to compute the final score, with each worksheet contributing **3%** to the final score

2. Mid-Term Examinations (36%): Two midterm examinations of 75 min length will be given, each counting **18%** to the final grade. **NO MAKE-UP EXAMINATIONS WILL BE GIVEN.** You are only allowed to use the information provided on the examination paper. You must bring your own (non-programmable) calculator. No smart phone, smart watch or similar instruments are allowed during exam.

Date	Chapters
5 Mar	1,2,3
16 Apr	4,5,6

3. Final Exam Preparation Period. Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's Final Exam Preparation Period policy (<https://apps.hr.ou.edu/FacultyHandbook#4.10>).

4. Final Exam (40%): The final examination will be given on **Friday May 15, 8:00 am – 10:00 am**. It will be a comprehensive **two-hour** examination covering all of the course materials. **NO MAKE-UP FINAL EXAMINATION WILL BE GIVEN.** You are only allowed to use the information provided on the examination paper. You must bring your own (non-programmable) calculator. No smart phone, smart watch or similar instruments are allowed during exam.

5. Final Grade: The minimum final score for a **GUARANTEE 'A' is 90%; 'B' is 77%; 'C' is 60%; 'D' is 50%. The grade will be 'F' if the final score is below 50%.** According to the Provost office should students not completing 70% or more of a course they have to be issued a grade/mark of "I." The 70% refer to attendance to class and/or exams, i.e., if you are excused for more than 30% of class and/or exams you will receive an "I".

6. Grading Errors and Extra Credits: All grading mistakes have to be resolved within **one** week after the examinations are returned to the students. Grading mistakes found in the final examination have to be resolved immediately with the instructor. *Solutions to all examinations will be posted on the web within a week after they are graded.* No grade changes will be made at the end of term on the basis of a student wishing to obtain a higher grade than was earned by point total. **No extra credit will be given.**

7. Academic Integrity: Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at http://integrity.ou.edu/students_guide.html. In order to be successful in this class, all work on exams and quizzes must be yours, and yours alone. *You may not solicit or receive outside help.* On examinations and quizzes you will never be permitted to use your notes, textbooks, ect. (I utilize plagiarism checkers and expect students to adhere to the academic integrity proscribed for OU students). Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Students engaging in academic misconduct (including cheating, plagiarism, and any other action that may improperly affect evaluation) will be subject to sanctions in accordance with the Norman Campus Academic Misconduct Code. *I will assign an "F" for the course* and may recommend expulsion from the University for such violations

8. Copyright Syllabus Statement for In-Person or Online Courses: *Sessions of this course may be recorded or live-streamed only by me.* These recordings are the intellectual property of the individual faculty member and may not be shared or reproduced without the explicit, written consent of the faculty member. Unauthorized audio/video recording is strictly prohibited in this course and its associated online spaces. *Students may not share any course recordings with individuals not enrolled in the class or upload them to any other online environment.* This policy protects all participants and respects intellectual property and FERPA rights. In addition, privacy rights of others such as students, guest lecturers, and providers of copyrighted material displayed in the recording may be of concern. Violations and any refusals to comply may result in disciplinary action through the Office of Student Conduct and/or removal from the classroom with an unexcused absence.

Disclaimer: I reserve the right to change by addition and/or subtraction any and/or all materials contained in this syllabus. This includes, but is not limited to, course content, assignments, scheduled dates, and fraction(s) of the final grade assigned to individual items within the course. Although your attendance at the lecture is not required, you are responsible for any announcements made in class, including changes in the examination schedule, course content, assignments, scheduled dates, and fraction(s) of the grade assigned to individual items within the course. If changes become necessary, I will announce them as early as possible.

Last update: Jan. 20, 2026

University Policies:

Codes and Policies of Behavior Policy: Each student has to be acquainted with the University codes, policies, and procedures involving academic misconduct, grievances, sexual and ethnic harassment, and discrimination based on physical handicap.

Mental Health Support Services

Support is available for any student experiencing mental health issues that are impacting their academic success. Students can either been seen at the University Counseling Center (UCC)

located on the second floor of Goddard Health Center or receive 24/7/365 crisis support from a licensed mental health provider through [TimelyCare](#). To schedule an appointment or receive more information about mental health resources at OU please call the UCC at 405-325-2911 or visit [University Counseling Center](#). The UCC is located at 620 Elm Ave., Room 201, Norman, OK 73019.

Title IX Resources and Reporting Requirement

The University of Oklahoma faculty are committed to creating a safe learning environment for all members of our community, free from sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX. There are resources available to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you have (or someone you know has) experienced any form of sex-based discrimination or violence and wish to speak with someone confidentially, please contact [OU Advocates](#) (available 24/7 at 405-615-0013) or [University Counseling Center](#) (M-F 8 a.m. to 5 p.m. at 405-325-2911).

Because the University of Oklahoma is committed to the safety of you and other students, and because of our Title IX obligations, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report sex-based violence that has been disclosed to us to the Institutional Equity Office. This means that we are obligated to report sex-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and during Student/Office Hours. You may also choose to report directly to the Institutional Equity Office. After a report is filed, the Title IX Coordinator will reach out to provide resources, support, and information and the reported information will remain private. For more information regarding the University's Title IX Grievance procedures, reporting, or support measures, please visit [Institutional Equity Office](#) at 405-325-3546.

Adjustments for Pregnancy and Related Issues

Should you need modifications or adjustments to your course requirements because of pregnancy or a pregnancy-related condition, please request modifications via the [Institutional Equity Office](#) website or call the Institutional Equity Office at 405/325-3546 as soon as possible. Also, see the Institutional Equity Office [FAQ on Pregnant and Parenting Students' Rights](#) for answers to commonly asked questions.

Reasonable Accommodation Policy

The University of Oklahoma (OU) is committed to the goal of achieving equal educational opportunity and full educational participation for students with disabilities. If you have already established reasonable accommodations with the Accessibility and Disability Resource Center (ADRC), please log into iAdvise to request your semester accommodations as soon as possible and contact me privately, so that we have adequate time to arrange your approved academic accommodations.

If you have not yet established services through ADRC, but have a documented disability and require accommodations, please complete [ADRC's pre-registration form](#) to begin the registration process. ADRC facilitates the interactive process that establishes reasonable accommodations for students at OU. For more information on ADRC registration procedures, please review their [website](#). You may also contact them at (405)325-3852 or adrc@ou.edu, or visit www.ou.edu/adrc for more information.

Note: disabilities may include, but are not limited to, mental health, chronic health, physical, vision, hearing, learning and attention disabilities, pregnancy-related. ADRC can also support students experiencing temporary medical conditions.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [\[See Faculty Handbook 3.15.2\]](#)

Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's [Final Exam Preparation Period policy](#).

Emergency Protocol

During an emergency, there are official university [procedures](#) that will maximize your safety.

Severe Weather: If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather.

1. Look for severe weather refuge location maps located inside most OU buildings near the entrances.
2. Seek refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. Go to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. Get in, Get Down, Cover Up
5. Wait for official notice to resume normal activities.

Additional [Weather Safety Information](#) is available through the Department of Campus Safety.

The University of Oklahoma Active Threat Guidance

The University of Oklahoma embraces a Run, Hide, Fight strategy for active threats on campus. This strategy is well known, widely accepted, and proven to save lives. To receive emergency campus alerts, be sure to update your contact information and preferences in the account settings section at [one.ou.edu](#).

RUN: Running away from the threat is usually the best option. If it is safe to run, run as far away from the threat as possible. Call 911 when you are in a safe location and let them know from which OU campus you're calling from and location of active threat.

HIDE: If running is not practical, the next best option is to hide. Lock and barricade all doors; turn off all lights; turn down your phone's volume; search for improvised weapons; hide behind solid objects and walls; and hide yourself completely and stay quiet. Remain in place until law enforcement arrives. Be patient and remain hidden.

FIGHT: If you are unable to run or hide, the last best option is to fight. Have one or more improvised weapons with you and be prepared to attack. Attack them when they are least expecting it and hit them where it hurts most: the face (specifically eyes, nose, and ears), the throat, the diaphragm (solar plexus), and the groin.

Please save OUPD's contact information in your phone.

NORMAN campus: *For non-emergencies call (405) 325-1717. For emergencies call (405) 325-1911 or dial 911.*

TULSA campus: *For non-emergencies call (918) 660-3900. For emergencies call (918) 660-3333 or dial 911.*

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates:

1. *LEAVE* the building. Do not use the elevators.
2. *KNOW* at least two building exits
3. *ASSIST* those that may need help
4. *PROCEED* to the emergency assembly area
5. *ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues.*
6. *WAIT* for official notice before attempting to re-enter the building.

[OU Fire Safety on Campus](#)