

COURSE SYLLABUS CHEM 4449 (LECTURE & LABORATORY) PHYSICAL CHEMISTRY II
4 CREDIT HOURS

Professor: Dr. Darren L. Williams (DW)

Daily office hour: MWF 11AM, TTh 9:30AM all other times by appointment via Williams@shsu.edu.

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Friend DW at <http://www.facebook.com/pchem4all/> and follow @pchem4all

DW's science blog is <http://pchem4u.wordpress.com/> (← *pchem4all* was taken... bummer.)

1. Course Description

This course will cover thermochemistry, the laws of thermodynamics, phase equilibria, and kinetics. A minimum grade of C in CHM 448 is the prerequisite. The four-hour course meets for 3 hours of lecture and four hours of lab work per week. *To be effective, you will have to study an additional 12 to 15 hours per week.*

2. Course Objectives

The main course objectives are:

- IDEA Objective #2: To learn fundamental principles, generalizations, and theories.

3. Enabling Objectives

The following objectives will enable the student to achieve the course objectives.

- Explore the quantum roots of thermodynamics (Chapters 29[12]-32[15])
- Master the applications of thermochemistry and thermodynamic cycles (Chapters 1-6)
- Describe the properties of real solutions and materials (Chapters 7-11).
- Describe the basics of non-equilibrium systems (Chapters 33[16]-34[17])
- Perform laboratory experiments and measurements related to the course material.
- Use computational chemistry programs to predict and confirm course principles.
- Use Microsoft Excel for numerical integration, multiple least-squares regression, Boolean logic operators, and non-linear equation modeling.

4. Required Textbooks

- Required: Physical Chemistry, 2nd Ed. by Thomas Engel and Philip Reid, Pearson Benjamin Cummings, (ISBN: 0-321-61505-0) OR Thermodynamics, Statistical Thermodynamics, and Kinetics, 2nd Ed., by Thomas Engel and Philip Reid, Pearson Benjamin Cummings, (ISBN: 0-8053-3844-6)

5. Grading Policy

- To determine the final course grade, the student's numerical average will be compared to course requirements, to peer performance, and to the definitions set forth in the University Catalog. Specific grade cut-off values are not predetermined.
- Students taking this course for graduate credit will be required to prepare an additional report that incorporates various facets of the course into one advanced problem. This report will constitute an additional 10% towards the final grade average. This results in the following weighting factors: Attendance = 5% Homework = 5%, Laboratory = 10%, Exams = 70%, Final Report = 10%.

Category	Weight
In-class Participation	5%
Out-of-class Participation	5%
Laboratory	15%
Exams	75%

6. In-Class Participation Policy (Attendance, Preparation, Engagement)

- **Attendance** Students will not be penalized for missing up to three hours of lecture as long as examinations and other assigned work have not been missed. Each absence beyond 3 will result in a loss of 5%.
- Laboratory attendance is mandatory. If unavoidable conflicts arise, then arrangements should be made in advance by the student. The schedules of the TA and the professor take precedence over the schedule of the student (including work schedules) when making arrangements for makeups.
- An unannounced and unaddressed laboratory absence will yield a **failing grade (an F)**.
- **Preparedness** Being unprepared (like showing up to the exam without a scantron) will result in a loss of 5%.
- **Engagement** Falling asleep or failing to engage in classroom discussions will result in a loss of 5%.

7 Out-of-class Participation (Homework and Responsiveness)

- **Homework** assessment will take place on Blackboard. The only way to make 100% on the homework is to take the test once to see what material you know. Then, print the pdf of the homework assignment. Do the problems, and then enter your answers on Blackboard. See if you improved. Work on the problems you do not understand until you figure them out. Then, take the exam again. Repeat until you have 100%. If you wait until the day before the exam to enter your answers, you will NOT get a 100% because you did not show that you participated in the process of learning the material. If you do all these iterations in a single day, you will NOT get a 100%. DW wants to see you interact with the material over several days. There will be a grading rubric placed on Blackboard to explain the scoring. Most of the exam material will come from modified Blackboard homework problems. If you do not know WHY the homework multiple choice answers are wrong and right, then you will do poorly on the exams. One or two exam questions will come from “A-level” problems or A-level concepts suggested in class. (<http://pchem4u.wordpress.com/2013/01/14/the-war-on-cramming/>)
- **Responsiveness** is critical in “the real world”. You must respond to emails from DW and the TA within 24 hours. Many times a response is merely a “thank you” acknowledging that you received an announcement. But often action is needed on your part, and you must respond accordingly. A gradebook item will be used to keep track of those who 1) become “unresponsive”, 2) lose emails, or 3) reach the storage limits of their campus inbox. This gradebook item will be averaged into the Out-of-class Participation average. DW will not use off-campus emails, because the use of private email accounts are not allowed in some “real world” employment situations. You should learn how to clean up your campus account.

8. Laboratory Work

- The laboratory experiments and the requirements for laboratory reports will appear on Blackboard as the semester progresses. Lab work will feed directly into the exams in both the multiple-choice sections and the open-ended questions. **Success on the exams requires full effort on the laboratory portion of the course.**
 - Sometimes oral instructions and modifications are given in class. These are binding, and detailed notes of what is said in class are required for success.
 - The top priority for laboratory work is SAFETY!
 - Safety glasses or goggles **MUST** be worn in the CFS 313 or 235 physical chemistry laboratories.
 - If the actions of any student are deemed to be unsafe and hazardous to themselves, their peers, or the well-being of the facilities, the student will be removed from the laboratory, and an appointment will be made with the department chair to evaluate a course of action.
 - **The names of students who leave lab early will be recorded by the TA, and these students will not receive any further help from the TA or DW in completing their assignments.**
- Students taking this course for graduate credit are to choose one laboratory experiment that needs improvement, and prepare an improvement package that is suitable for use in future laboratory sections. This assignment will be graded and will account for ten percent of the weighted numerical average.
- Students should not be in the laboratory if they are not working on their experiment. Visitors to the laboratory are prohibited unless escorted by departmental personnel. If a student needs to meet with others who are not registered in the course they must leave the laboratory.

9. Exams

- **Exams will utilize a Scantron form 882-E**
- The final exam week is May 13 – 17th and **you should not** make travel plans until the 18th!
- There will be multiple midterm exams and a comprehensive final exam.
- Exams dates are listed on the schedule on Blackboard. However, DW reserves the right to move the exam forward or backward depending upon the abilities of the majority of the students in the class.
- The exam answer sheets will remain the property of SHSU as a record of student performance.
- Make-up examinations are not given. In the unfortunate case, where a student misses an exam, the professor will discuss possible remedies with the student provided that all the following conditions are met:
 - The student was absent on the exam date.
 - The student telephoned in advance or left a voice mail message or email message alerting the professor to their absence along with a description of why they are to miss the exam. (All information will be kept in strict confidence.)

- The professor also reserves the right to assign an exam grade of 0% if the absence was not properly handled or was unjustified. Appeals will be handled in accord with University Policy Statement 900823, Academic Grievance Procedures for Students.
- The final comprehensive examination will be averaged with the midterm exams to determine the total exam average.

Employment Recommendations

For Your Information: Dr. Williams will not write recommendation letters for students who do not make a B or better unless there is some very unusual reason to do so.

Academic Dishonesty

Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, and the abuse of resource materials. DW reserves the right to ask for an oral explanation of work submitted to determine if the student actually performed the work. This should not be construed as an accusation of academic dishonesty. Only in cases where the student cannot demonstrate the most basic explanation of what they submitted as their original work will there be any question of dishonesty. If DW or the TA believes that a homework assignment or laboratory report is a copy of another person's work, BOTH copies will receive a grade of 0%, and disciplinary action will be considered.

Additional Disclaimers: Rules of Conduct: Cell phones must be turned off before class begins. Students are prohibited from text messaging, emailing, Facebooking, or engaging in any other form of distraction. Students who are especially disruptive will be asked to leave and may be reported to the Dean of Students for disciplinary action. **Americans with Disabilities Act:** No disability accommodations can be made until the student registers with the Counseling Center. **Visitor Policy:** Dr. Williams will decide whether or not visitors will be allowed to remain in the classroom. **Religious Holidays** University policy (APS 861001) and state law (Section 51.911(b), Texas Education Code) require that a student who is absent from class for the observance of a religious holy day fill out form (see APS 861001) in the first week of class. This form must be signed by the instructor, the student, and approved by the departmental chair. **Course Material Copyright** ©2011 Course material is reserved to Sam Houston State University, and may not be mass-produced, posted online, sold, or reproduced for purposes other than personal use by students registered for this course in the current semester.