

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

### What you will need for this course:

- **Either** the full book (Physical Chemistry, 3rd Ed. by Thomas Engel and Philip Reid), **or** the half-book (Thermodynamics, Statistical Thermodynamics, and Kinetics, 3<sup>rd</sup> Ed. by Thomas Engel and Philip Reid) are required.
- Five scantron forms (882-E).
- One composition book is required to be used for homework.
- One deck of 3x5 inch notecards is optional.
- Goggles or safety glasses with side shields are required for lab.

### Instruction

Professor: Dr. Darren L. Williams (DW) Phone: (936)294-1529; CFS 317G; Lab: CFS 235; [http://www.shsu.edu/~chm\\_dlw/](http://www.shsu.edu/~chm_dlw/)  
Office hours will be posted on Blackboard. Appointments can always be made via [Williams@shsu.edu](mailto:Williams@shsu.edu).

### Course Description from the Catalog

The developments of thermochemistry, phase diagrams, equilibria, and kinetics are traced from the statistical mechanics of quantum states to the macroscopic observations of thermodynamics. Four-hour laboratory. Credit 4. Prerequisites: A minimum grade of C in CHEM 1311/1111, 1312/1112, 2323/2123, 2325/2125, 4448. Spring.

### Course Objectives from the IDEA Survey

- IDEA Objective #1: To gain factual knowledge (terminology, classifications, methods, trends)
- IDEA Objective #2: To learn fundamental principles, generalizations, and theories.

### Enabling Objectives

At the conclusion of the course the student will have:

- Explored the quantum roots of thermodynamics
- Mastered the applications of thermochemistry and thermodynamic cycles
- Described the properties of real solutions, materials, non-equilibrium systems
- Performed thermodynamic laboratory experiments and measurements
- Predicted thermodynamic properties using computational chemistry programs.
- Demonstrated multiple least-squares regression, Boolean logic, and non-linear equation modeling in MS Excel.
- Created unique solutions to chemical problems using all of the above tools and experiences.

Table 1: Weighting Factors	
Category	Weight
In-class Participation	Required
Out-of-class Participation	10%
Laboratory	20%
Exams	70%

### 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 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 assigned by the instructor and typically associated with one of the laboratory exercises. This report will constitute an additional 10% towards the final grade average. This results in the following weighting factors: Out-of-class Participation = 5%, Laboratory = 15%, Exams = 70%, Final Report = 10%.

### In-Class Participation Policy (Attendance, Preparation, Engagement)

- *When considering letter grades, students who are on the edge of a grade cut-off will receive the lower letter grade if they have regularly missed class or have shown themselves to be poorly prepared or have shown little interest in the material.*
- **Lecture Attendance** is required and is recorded by using your login ID (abc123) on the Kahoot Quizzes.
- **Laboratory attendance and reports** are mandatory. Arrangements should be made in advance by the student.  
**CRITICAL:** An unannounced and unaddressed laboratory absence will **yield a failing grade** (an F) in the course. If **any** lab report is not turned in, then that student will receive **a failing grade** (an F) in the course. Communication is the REAL issue. Sloppy behavior like showing up to the exam without a scantron or sleeping in class will be recorded.

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

- **Documentation of Homework Effort:** The purpose of homework is to help YOU learn the material. Every student will be required to keep **a problems composition notebook**. The hand-written homework problems (and flash cards) should be scanned into a **single pdf file** and uploaded to blackboard EVERY THURSDAY by 11:59 PM. No late submissions or hard-copies will be accepted. **Four flashcards count as one page, and each page gets 1 point for a max of 10 points per week.** If you make note cards, scan them in groups of FOUR for easy grading. *Waiting until Thursday night may cause a student to receive 0 points if there are computer problems. This penalizes procrastination.*
- **Responsiveness** is critical in "the real world". Ten points will be deducted from the Out-of-class Participation grade for 1) being "unresponsive", 2) losing emails, or 3) reaching the storage limits of your campus inbox. DW will not use off-campus emails, because the use of private email accounts are not allowed in some "real world" employment situations.

## Laboratory Work

- Meet in CFS 102 each week to receive instructions before proceeding to the data collection locations.
- 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 a timely and genuine 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 on that particular lab.**
- Visitors to the laboratory are prohibited unless approved by departmental personnel.

## Exams

- **Exams will utilize a Scantron form 882-E.**
- Exam dates are listed on the schedule on Blackboard. The final for this course is Monday May 7<sup>th</sup> from 8 to 10 AM.
- The exams and scantrons will remain the property of SHSU as a record of student performance. The students are welcome to compare their exams to the key in DW's office. Taking photos or scanning the key will be punished as academic dishonesty.
- Make-up examinations are not given. If a student misses an exam, the professor will discuss possible remedies with the student provided that all the following conditions are met: 1) the student was absent on the exam date and 2) 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. An exam grade of 0% will be assigned if the absence was not properly handled or was unjustified. Appeals will follow 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

*Dr. Williams will not write recommendation letters for students who do not make A's in this class, 4448, or 4380.*

## Academic Dishonesty

Any student found guilty of dishonesty (cheating, plagiarism, and the abuse of resource materials) in any phase of academic work will be subject to disciplinary action. 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. The use of old exams other than those provided on Blackboard or someone else's lab reports from previous years will be punished **severely**.

**Additional Disclaimers: Rules of Conduct:** Cell phones must be muted 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:** Any student with a disability that affects his/her academic performance should contact the Office of Services for Students with Disabilities in the SHSU Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786) to request accommodations.

**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**

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