

### Course Information

- Darren L. Williams, Ph.D. (a.k.a. DW)
  - Office: CFS 317 G, Office hours are 11 AM to 11:50 AM, MTWTF, and other times by appointment. Email is the preferred method for making appointments.
  - Contact (936)294-1529, [williams@shsu.edu](mailto:williams@shsu.edu), [http://www.shsu.edu/~chm\\_dlw/](http://www.shsu.edu/~chm_dlw/),
  - Twitter: @pchem4all and [www.facebook.com/pchem4all](http://www.facebook.com/pchem4all)
- Lecture will meet in CFS 103 on Monday, Wednesday, and Friday from 8 to 9 AM.
- The laboratory will be open on Monday, Tuesday, and Wednesday from 1 to 5 PM. We will meet in different locations throughout the semester (CFS 101, and other places as announced).
  - Lab attendance is required on **your lab day** each week.
  - A **binding** lab schedule will be developed in the first 2 weeks of the semester.
  - The lab meeting place will be announced in class or on Blackboard each week.

### Course Description

The foundations of thermodynamics and spectroscopic methods (radio-frequency, microwave, infrared, Raman, UV-visible, and X-ray) are developed from first principals with an atomistic point of view.

- Four-hour laboratory. Writing Enhanced. Fall. Credit 4.
- Prerequisites: A minimum grade of C in CHEM 2325, MATH 1430 and one year of physics.

### Course Objectives

The main course objectives are:

- IDEA Objective #2: To learn fundamental principles, generalizations, and theories.
- IDEA Objective #8: To develop skill in expressing oneself orally or in writing.

Enabling Objectives direct student effort toward the course objectives. The students will be exposed to and demonstrate some mastery of:

- Experiments that illustrate the need for quantum theory.
- The mathematics associated with basic quantum theory.
- Spectroscopic measurements to determine physical constants.
- The use of symmetry operators to interpret spectroscopic measurements.
- The use of computational chemistry programs that support the above objectives.
- The use of Microsoft Excel for numerical integration, non-linear equation modeling, and spectral simulation.

### Required Textbook

Quantum Chemistry and Spectroscopy 2nd Ed, by Engel and Reid, Pearson – Benjamin Cummings, New York, 2003 (ISBN-0-3216-1504-2) If taking both semesters, you may wish to buy the larger edition that contains the fall and spring books in one volume: Physical Chemistry 2nd Ed, (ISBN-0-3216-1505-0)

### Grading Scheme

The numerical average will be computed according to the weighting factors in the Table 1. Specific letter grade cut-off values are not predetermined because of the semester-by-semester variation of exams, classes, and circumstances. To determine the course letter 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 (<http://www.shsu.edu/catalog/scholasticrequirements.html>) where average performance is a minimum of a C letter grade.

### Attendance and Participation Score

This tracks MORE than mere attendance. Active preparation for and participation in lecture is expected. In accord with university policy, students will not be penalized for absences of up to three hours as long as examinations and other assigned work have not been missed. Table 2 explains the score policy. The student is responsible for signing the roster at the beginning of each class period. Signing the roster at the beginning of class is counted as minimum participation, but it does not guarantee full participation credit for that day. Leaving early, sleeping, Facebooking, texting, etc in class is counted on the roster as non-participation.

**Table 1: Numerical Average Weighting Factors**

Category Scores (0 – 100%)	Weighting Factor
<u>Participation</u> Score	0.05
<u>Participation</u> in Formative Assessments (Homework)	0.10
Summative Assessments (Exam Average)	0.60
Laboratory Average	0.25

**Table 2: Attendance Grading Scheme**

Number of Absences	Participation Score
0 to 3	100%
4 or more	Participation Average

**Forgetting to sign the roster is equivalent to non-participation.**

### Formative Assessment (Blackboard surveys, tests, and problem sets)

The purpose of formative assessment is to help YOU gauge how well you are learning the material. Formative assessment will consist of problem sets, tests, and surveys that are posted on Blackboard. Your grade will depend upon your participation in these assessments. If you procrastinate, and try to do all of the assessments on the day before an exam, you

will NOT receive full credit even if you get everything "right". A rubric for the formative assessment participation score will be posted so that you may take full advantage of this learning tool.

### Exams

The exam schedule will be continually updated throughout the semester on Blackboard. **BRING A SCANTRON 882-E and a pencil to each exam.** 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.

DW does not give make-up examinations. In the unfortunate case, where a student misses an exam, DW will discuss possible remedies with the student provided that all the following conditions are met:

1. The student was absent on the exam date.
2. The student telephoned in advance or left a voice mail message or email message alerting Dr. Williams to their absence along with a description of why they are to miss the exam. (All information will be kept in confidence.)

DW reserves the right to modify the grading scheme such that the final exam may compensate for the missed exam course percentage. DW also reserves the right to assign an exam grade of 0% should he deem 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 2-hour final **comprehensive** examination will most likely be on Monday December 10 from 8 to 10 AM. Tell your family and friends that you CANNOT leave town early for vacation, work, leadership conferences, rodeo finals, or anything. **Modify your plans NOW to fit your academic schedule.** The final exam will be weighted equally with the other exams in computing the exam average.

### Laboratory Work

The number of lab experiments and the requirements for lab reports will be provided on Blackboard as the semester progresses. The extensive writing component of this course is present in the laboratory reports. Grammar and writing style will be included in the grading scheme for each report.

The top priority for laboratory work is SAFETY! Safety glasses or goggles MUST be worn and aprons or lab coats are encouraged **when doing wet chemistry or cleaning glassware.** If the actions of any student are deemed to be unsafe and hazardous, 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 second priority for laboratory work is CLEANLINESS. All the students are responsible for keeping the whole laboratory clean. DW will deal fairly and firmly with any students who consistently make this task difficult for their peers. The third priority for laboratory work is PRODUCTIVITY. **The names of students who leave lab early will be recorded by the TA, and these students will lose 10% of their participation score.**

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.

### 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:** 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 ©2012** 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.