VIRGINIA STATE UNIVERSITY
SCHOOL OF ENGINEERING SCIENCE AND TECHNOLOGY
DEPARTMENT OF CHEMISTRY AND PHYSICS
COURSE SYLLABUS: FALL SEMESTER 2008

CHEM 401 PHYSICAL CHEMISTRY I - 3 SEMESTER HOURS

Victor H. Vilchiz, Ph.D. — **Office: Hunter-McDaniel Room 235N**
Office Hours: M 4-5 — **Office Phone: (804)524-5574**
T 8:30-10:30, 3:30-5:00 — **Dept Office: (804)524-5438**
W 10:00-11:30 — **e-mail:vvilchiz@vsu.edu**
Plus 2 hrs by appointment — **www.sest.vsu/~vvilchiz/index.htm**

COURSE DESCRIPTION:

This course is a non-laboratory treatment of physical chemistry with emphasis on chemical thermodynamics, phase equilibria, kinetic theory and chemical kinetics.

COURSE TEXT:

Engel and Reid *Thermodynamics, Statistical Thermodynamics, & Kinetics*, 1st edition, Pearson/Benjamin Cummings, San Francisco (2006)

LEARNING OUTCOMES, ACTIVITIES AND EVALUATION PROCEDURES:

OUTCOMES

1. **The student will discover the relationships between mathematical analysis and the physical and chemical properties of matter.**

2. **Students will learn the ways the integral and differential calculus is used in the development of the equations which describe the properties of matter.**

3. **The student will develop an understanding of ideal gas concept and contrast it with the properties of real gases.**

4. **The student will learn basic principles of chemical thermodynamics and become familiar with the criteria for reaction spontaneity.**

5. **The student will learn the concept of free energy and how to apply it to chemical and physical equilibrium.**

6. **Students will learn the phase rule and to apply the phase rule to heterogeneous equilibria and to the study of phase diagrams.**

ACTIVITIES & EVALUATION PROCEDURE

- **Course material will be introduced primarily by way of a lecture format. Questions are**

encouraged in lectures.

- **Homework assignments will be given for each chapter and collected.**

- **There will be 6 quizzes for which you will be allowed to use that week's homework.**

- **Three lecture tests will be given during the semester as listed on the Class Schedule. Test questions will be problems, essay and multiple-choice depending upon the appropriateness.**

- **A term paper will be assigned on a current chemistry topic. You will be provided a draft schedule that will be strictly enforced.**

- **A cumulative final exam will be use to measure information retention. The lowest test score will be replaced by the score on the final examination if the final exam grade is higher than the lowest test grade.**

COURSE REQUIREMENTS:

CHEM 102 and MATH 201

NO MAKEUP QUIZZES WILL BE GIVEN BECAUSE OF ABSENCES (FOR GOOD REASONS OR FOR ANY OTHER REASONS).

Tests - Test dates are given as a scheduling guide and may change depending on the rate at which the material is covered. NO MAKE-UP TESTS WILL BE GIVEN UNLESS THE INSTRUCTOR HAS APPROVED A MAKEUP BEFORE THE SCHEDULED TEST HAS BEEN GIVEN. WHEN PROBLEMS ARISE, PLEASE CALL MY OFFICE (PHONE 524-5574). It is your responsibility to arrange a time for taking the exam; I WILL NOT give a make-up exam after I have returned the exam to the class.

GRADE:
students will be evaluated as follows:

10%	**Homework (8)**
25%	**Quizzes(6) drop one**
30%	**Tests (3)**
25%	**Final Examination**
10%	**Term Paper**

Additional Information

- **The academic regulations related to cheating, attendance, grading and conduct, as stated in the Student Handbook, are attached under the heading "University Policies."**

- **Students who are covered under the American Disabilities Act should privately inform the teacher of this fact so that appropriate instructional arrangements can be made.**

CLASS SCHEDULE

Week of	Topic	Chapter
Aug. 18	Fundamental Concepts of Thermodynamics & 1st Law	1 & 2
Aug. 25	1st Law and State Functions Quiz 1 8/28	2 & 3
Sept. 01	State Functions and Thermochemistry	3 & 4
Sept. 8	Enthalpy & 2nd Law Test 1 9/11	4 & 5
Sept. 15	2nd and 3rd Laws	5
Sept. 22	Equilibrium Quiz 2 9/25	6
Sept. 29	Real Gases and Phase Diagrams Test 2, 10/2	7 & 8
Oct. 6	Phase Diagrams and Ideal Solutions Quiz 3 10/9	8 & 9
Oct. 13	Real Solutions and Electrolytes	9 & 10
Oct. 20	Electrochemical Cells	11
Oct. 27	Boltzman Distribution Quiz 4 10/30	13
Nov. 3	Kinetic Theory of Gases	16
Nov. 10	Transport Phenomena Quiz 5 11/13	17
Nov. 17	Elemental Kinetics Test 3 11/20	18
Nov. 24	Kinetics and Mechanisms Quiz 6 11/25	18 & 19

FINAL EXAM → Thursday, DECEMBER 4TH 1:00-3:00 PM