

Chemistry 402  
MWF 1.00 am – 1:50 pm,

PHYSICAL CHEMISTRY II

Spring 2004

Instructor: Urvashi Gangal, Ph.D.  
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Office Hours: M (3.00-5.00)  
W (2.30-4.00)  
R (10.00-12.00)  
F (2.30 – 3.30)

Course Description: Fundamental interpretations of the physical principles of chemistry. An extension of chemistry 401, which focuses on quantum chemistry, atomic and molecular structure, statistical mechanics, spectroscopy and kinetics.

Course Text:

Physical Chemistry by David W. Ball, Thomson Brooks/Cole

Knowledge:

- 1) The student will continue to explore the relationship between mathematical analysis and physical and chemical properties of matter.
- 2) The student will learn the uses of integral and differential calculus in developing the basic equations of atomic and molecular structure, statistical mechanics and chemical kinetics.
- 3) The student will learn to interpret graphical representations of physical phenomenon.
- 4) The student will learn the basics of spectroscopy.

Skills:

- 1) The student will derive equations for specific phenomena from physical laws using algebra and calculus.
- 2) The student will use the postulates of quantum mechanics to solve classical elementary problems.
- 3) The student will derive elementary and intermediate equations of chemical kinetics.
- 4) The student will apply approximation techniques of quantum chemistry to common chemical problems.

Abilities

- 1) The student will be able to describe the various abinitio and approximate calculation methods of quantum chemistry.
- 2) The students will be able to use various commercial approximate methods of quantum chemistry to determine the properties of molecules.
- 3) The student will be able to use spectroscopic data to determine the structural parameters of simple molecules.
- 4) The student will be able to calculate the elementary kinetics parameters properties for reactions.
- 5) The student will be able to use various commercial approximate methods of quantum chemistry to determine the properties of molecules.

#### Course requirements

Course activities will be introduced primarily by the way of a lecture format. However blackboard will also be used. Please make sure you are enrolled in blackboard by second week of class.

#### Student evaluation:

Quiz and homework - 15 %. (A total of five will be given). The lowest score will be dropped. No makeup quiz will be given.

Tests - 60% (Four tests will be given). The dates of test are listed on class schedule. However the date may change depending on the rate at which the course is covered. The score on the final will replace the lowest test score if the final exam score is higher than the lowest test score

Final - 25%

Grading is in accordance with "University Policies" (see attached)

#### Additional information

The academic regulations related to cheating, attendance, grading and conduct are attached under universities policies.

Students covered under the disability act should privately inform their instructors so that appropriate instructional arrangements can be made.