

## **CHEM 2416, GENERAL CHEMISTRY II**

*Fall Semester, 2014*

Chemistry Department, Dr. Treacy Woods, Department Chair

### **COURSE DESCRIPTION**

This is a continuation of CHEM 2415 with an emphasis on chemical equilibrium, thermodynamics, electrochemistry and kinetics. This course includes one semester hour credit for laboratory sessions that are devoted to qualitative analysis.

### **COURSE SEQUENCE IN CURRICULUM**

This course is the second part of a traditional two part freshman chemistry lecture and laboratory course sequence. (CHEM 2415, General Chemistry I is the first part.)

### **PRE-REQUISITE INFORMATION**

CHEM 2415

### **INSTRUCTOR INFORMATION**

Name: Dr. Taiya Fabre  
E-mail: [tfabre@hbu.edu](mailto:tfabre@hbu.edu)  
Office Phone: 281-649-3191  
Office Location: S221  
Office Hours: Monday, Wednesday 1:00-2:00 pm and Tuesday, Friday 10:00-11:00 am  
or email for an appointment  
Web Page Address, Web Board, ListServ: Grades and course information will be posted on blackboard.

### **LEARNING RESOURCES**

Course Text: Petrucci, Harwood, and Herring, General Chemistry, 10th edition, Prentice Hall, 2011.  
Gelmini, Hilts, and Wismer, Solutions Manual General Chemistry, 10th edition, Prentice Hall, 2011.  
Laboratory Text: None  
Supplementary Text: None  
Other Required Materials: Non programmable calculator

### **COURSE OBJECTIVES**

#### Purpose of the course:

This is a continuation of CHEM 2415 and culminates in the study of chemical equilibria. Includes 44 clock hours of laboratory which is devoted to qualitative analysis.

#### Aims for the course:

Students will grow in mastery of the chemical principles found in the topical outline for both the laboratory and lecture.

#### On completion of this course, students should be able to:

1. Understand intermolecular forces with respect to solids, liquids, and gases.

2. Perform calculations involving solution concentrations expressed in molarity, molality, and mole fraction.
3. Determine the rate law expression for a chemical reaction.
4. Understand relationships involving chemical equilibrium.
5. Calculate the pH of a variety of solutions.
6. Understand the second law of thermodynamics and its relationship to the equilibrium constant.
7. Extend his/her knowledge of basic chemical principles through the use of the textbook, and by attending lectures.
8. Understand the basic concepts of electrochemistry

### **RELATION TO DEPARTMENTAL GOALS AND PURPOSES**

The chemistry department prepares students to respond to their call to share in the wise stewardship of the matter that makes up all of creation in their chosen career. The chemistry department provides a program for students that gives them:

“A thorough and practical knowledge of the intricate nature of matter;”

“The ability to explore and discover the depths of the beauty of matter;”

“The ability to analyze problems, formulate solutions to problems, and be creative in response to challenges related to the wise use of matter;”

“The ability to respect the matter in creation through preparation for excellent and ethical practice of chemistry in their chosen career.”

“The opportunity to complete a major that is comparable in curriculum to those at institutions with chemistry majors certified by the American Chemical Society (ACS).”

### **RELATION TO COLLEGE GOALS AND PURPOSES**

“...to prepare students for careers and further education in the natural sciences and mathematics in a nurturing Christian environment. The College will also serve the HBU community by providing science and mathematics classes that empower HBU students to meet the goals and requirements of their field of study and enrich their liberal arts education.”

### **RELATION TO THE PURPOSE STATEMENT OF THE UNIVERSITY**

University mission and purpose statement from the Houston Baptist University Catalog, 2009-2010: “...to provide a learning experience that instills in students a passion for academic, spiritual, and professional excellence as a result of our central confession, “Jesus Christ is Lord”

“...Committed to providing a responsible and intellectually stimulating environment that:

- fosters spiritual maturity, strength of character, and moral virtue as the foundation for successful living
- develops professional behaviors and personal characteristics for life-long learning and service to God and to the community
- meets the changing needs of the community and society
- remains faithful to the ‘**Nature of the Institution**’ statement”

“...Promotes learning, scholarship, creative endeavor, and service”.

## **ATTENDANCE**

Please see the official Attendance Policy in the HBU Classroom Policy on Blackboard. Students missing more than 25% of the class will be given a failing grade.

The professor will check roll at the beginning of class. If a student is not present when the roll is checked the student will be marked absent.

## **ACADEMIC ACCOMODATIONS**

Students needing learning accommodations should inform the professor immediately and consult the Academic Accommodations section of the HBU Classroom Policy posted on Blackboard.

## **COURSE REQUIREMENTS & GRADE SCALE**

### Course requirements:

In order to receive a minimum grade of C in Chemistry 2416, a student must do the following:

1. Perform satisfactorily on exams. The unannounced quizzes, lecture exams and final exam constitute 75% of the final grade. Neither the final grade, overall quiz grade, nor any of the exams will be curved or dropped.
2. Perform satisfactorily on all laboratory exercises described in the laboratory syllabus. The laboratory component of the course counts 25% toward the final grade average.

### **Lecture:**

There will be three lecture exams and a final exam. The lecture average is the average of the scores on the quizzes, final exam and three lecture exams.

NOTE: The grading standards not specifically mentioned in this syllabus will adhere to the general policy on grades as stated in the Houston Baptist University Bulletin of Information.

### Other Class Policies:

The student is responsible for checking their HBU email and blackboard frequently for course updates and policies.

### Grading standards:

The grading scale is as follows:

A = 90 – 100;    B = 80 – 89;    C = 70 – 79;    D = 60 – 69;    F = below 60

## **PROFICIENCIES:**

### Technology component:

Students use calculators to solve problems.

### Designated essay/writing component:

All exams are not totally multiple choice. Students are frequently asked to explain things in essay style and to work problems in a style that shows all of their work toward reaching an answer.

Reading component:

A textbook is used in the course.

Oral communication component:

Student responses are expected during lecture. Students interact with the laboratory professor during laboratory sessions.

Mathematics component:

Work with formulas is a routine part of the course.

Critical thinking component:

The critical thinking involved in problem solving is integral to the course. One example is students must learn to decide what the important active species are present in aqueous solutions in order to determine acidity and basicity of the solution.

**LATE WORK & TEST POLICY**

Late work:

Not applicable.

Missed tests:

A comprehensive makeup exam will be given near the end of the semester to anyone missing a lecture exam with a valid, verifiable reason. A student must contact the instructor within 24 hours of missing an exam. There are no makeup quizzes.

**EVALUATION**

Method of student appraisal of faculty:

Students will be given an opportunity to appraise the professor by completing the IDEA Faculty Evaluation Questionnaire, and/or the COSM course evaluation at the end of the semester. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

Method of evaluating student response to course:

Students will be given an opportunity to describe their response to the course by completing the IDEA Faculty Evaluation Questionnaire and/or the COSM course Evaluation at the end of the course. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

**LABORATORY DRESS CODE**

Students may be asked in advance to wear closed-toed shoes and long pants during certain experimental procedures.

Does not apply to this class.

## LABORATORY CONDUCT AND SAFETY

**IMPORTANT INFORMATION FOR THIS COURSE:** IF A STUDENT IS PREGNANT OR NURSING, SHE WILL NOT BE ALLOWED TO ATTEND THE LABORATORY SESSIONS BECAUSE SOME OF THE CHEMICALS, WHICH ARE NORMALLY INNOCUOUS, USED IN THESE LABORATORY EXPERIMENTS, MAY BE HARMFUL TO A DEVELOPING FETUS. IF A STUDENT BECOMES PREGNANT DURING THE COURSE, SHE MUST STOP ATTENDING THE LABORATORY SESSIONS IMMEDIATELY AND SHE IS TO NOTIFY HER PROFESSOR. THE PROFESSOR WILL DISCUSS OPTIONS THAT THE STUDENT WILL HAVE TO ENABLE HER TO COMPLETE THE COURSE REQUIREMENTS.

Does not apply to this class.

### **TOPICAL OUTLINE - *include table, calendar, or topical outline with dates***

Lecture Topic Schedule:

Introduction to Course  
Liquids, Solids, and Intermolecular Forces (Chapter 12)  
Solutions (Chapter 13)  
Exam 1 September 23, 2014 (Tuesday)  
Chemical Kinetics (Chapter 14)  
Principles of Chemical Equilibrium Chapter 15)  
Entropy and Free Energy (Chapter 19)  
Exam 2 October 23, 2014 Thursday  
Acids and Bases(Chapter 16)  
Acid Base Equilibria(Chapter 17)  
Exam 3 November 25, 2014 (Tuesday)  
Solubility and Complex Ion Equilibria (Chapter 18)  
Electrochemistry (Chapter 20)  
Final Exam: TBA  
Last day to withdraw with a "W": October 31, 2014

The content of this outline and the attached schedule are subject to change at the discretion of the professor.

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Student Signature – I have read and understand the syllabus for this class. I understand that the content of this syllabus and the topical outline are subject to change at the discretion of the professor. I have read and understand the HBU Classroom Policy posted on Black Board. **I promise to uphold the Code of Academic Integrity at Houston Baptist University and will not tolerate its violation by others.**