

CHEM 2415, GENERAL CHEMISTRY I

Fall Semester, 2014

Chemistry Department, Dr. Treacy Woods, Department Chair

COURSE DESCRIPTION

This course is for science majors. It is an introduction to chemical reactions, the mole concept, properties and states of matter, atomic structure, periodic properties, chemical bonding and molecular structure. This course includes one semester hour credit for laboratory sessions.

COURSE SEQUENCE IN CURRICULUM

CHEM 2415 is the first course in the traditional two course freshman chemistry lecture and laboratory sequence. It is intended for students with one year of high school chemistry completed. Proficiency in math at the level of college algebra is encouraged.

PRE-REQUISITE INFORMATION

MATH 1313 and CHEM 1404 or high school chemistry.

INSTRUCTOR INFORMATION

Name: Dr. Saul Trevino
E-mail: strevino@hbu.edu
Office Phone: 281-649-3058
Office Location: S107D
Office Hours: MWF 8:45-9:30 AM and TR 3:00-4:00 PM or by appointment
Web Page Address, Web Board, ListServ: Blackboard

LEARNING RESOURCES

Course Text: Petrucci and Harwood, General Chemistry, 10th edition, Macmillan, 2006.
Wismer, Solutions Manual to Accompany General Chemistry, 10th edition, Macmillan, 2006.
Laboratory Text: General Chemistry I Laboratory Manual, Summer 2010 revision (available in HBU bookstore)
Supplementary Text: <http://cw.prenhall.com/petrucci>
Other Required Materials: A non-programmable calculator (available in bookstore).
Safety goggles (available in HBU bookstore)

COURSE OBJECTIVES

Purpose of the course:

This is a study of the structure and properties of atoms and molecules and of the reactions they undergo. Includes 44 clock hours of laboratory.

Aims for the course:

The student will understand the atomic structure, properties and reactions of important types of compounds, oxidation-reduction and acid-base chemistry as well as become familiar with thermochemistry, and gas laws and periodic properties of the elements. The student will be able to treat quantitatively the mass, mole and volume changes that occur in chemical reactions.

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

Lecture:

1. understand the topics of chemistry well enough to answer questions, both numerical calculations and concept questions. The student must be able to synthesize new ideas in chemistry while integrating previous knowledge of math and science.
2. have a knowledge of basic chemical concepts through the use of the textbook and by attending lectures. This understanding will be deeper than that gained by a high school chemistry course.

Laboratory:

1. know a variety of basic laboratory techniques such as use of the analytical balance and volumetric glassware, quantitative transfer and filtering and gas collection.
2. pass a test on general laboratory safety rules and, thereafter, must demonstrate an ability to work in lab with a proper awareness of safety.
3. make careful observations and be able to record these accurately.
4. analyze laboratory data for accuracy and precision and use graphical methods to make a logical interpretation of experimental results.

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.

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:

1. The student will read assignments from the text.
2. The student will work assigned homework problems and check his/her answers with those provided in the Solutions Manual that accompanies the text.
3. The student will demonstrate an understanding of chemical concepts on several unannounced quizzes as well as four lecture exams and a final exam.

Grading standards:

Lecture:

In order to receive a grade of C or greater in CHEM 2415, a student must do the following:

1. Perform satisfactorily on exams and quizzes. The quiz average will constitute 10% of the final grade and the lecture exams will constitute 60% of the final grade. Neither the final grade nor any of the exams will be curved. A comprehensive exam will be given near the end of the semester. In-class workshops and Sapling Online Homework will constitute 5% of the final grade
2. Perform satisfactorily on all laboratory experiments. The laboratory component of the course counts 25% toward the final grade.
3. Homework is not graded. Answers are provided in the solutions manual.

Grading Scale used is;

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

Laboratory:

Each lab will be scored out of 100%. The scores will be derived as follows:

Data and Calculation (30 points)

This is essentially the report sheet which will be collected at the end of the lab period. Point distribution: neatness and organization (5 points); precision and accuracy of data (15 points); method and precision of the calculations (10 points).

Quiz (30 points)

This will be given prior to execution of the lab at each meeting. Questions will be drawn from the previous week's lab and from the lab to be done that particular day. The award of points on the lab quiz will be based on the accuracy and completeness of your answers. The quiz for the first lab session will include questions on SAFETY; be sure to study the SAFETY SECTION of the laboratory part of this syllabus and in the Laboratory Manual.

Advanced Study Assignment (10 points)

This is to be handed in at the beginning of each laboratory session. You have the option of working in groups on these, but bear in mind that the materials therein are quizable, so as you solve these problems in groups, make sure that you understand what you are doing. Readability, neatness, correct spelling and correct grammar will be expected.

Neatness of the work environment (10 points)

Each student is responsible for the neatness of his/her work area. Good laboratory results are always associated with a clean work environment. Keep your work bench clean all the time. At the end of each lab session, return glassware, reagents and other materials to their appropriate locations. Don't use the sinks as trash cans. Note where the trash cans are located in the lab and make use of them when the need arises. Of course, these points will be automatically deducted from your lab score, if and whenever you fail to comply.

Observation of Safety Regulations (10 points)

The student should read the safety regulations and rules in the Lab Manual. Any infraction of these rules will result in a loss of 10 points of the weekly score, including a possible dismissal from the laboratory.

Selective Estimate of Techniques and Preparation (10 points)

The laboratory instructor will observe and take note of the techniques and readiness of each student for each laboratory. A student well prepared should easily gain all 10 points of the weekly score in this category, but take note that these points are not awarded automatically.

Your graded lab results will be returned to you on a weekly basis. This will enable you to keep track of your progress in the laboratory.

PROFICIENCIES:

Technology component:

Basic use of calculators for solving numerical problems will be utilized.

Designated essay/writing component:

Some exams will require essay type answers.

Reading component:

Students are required to read the textbook in addition to the lecture provided during the class period.

Oral communication component:

Students are asked questions during the class period and some students will also be expected to go to the blackboard to correct exercises.

Mathematics component:

Basic college algebra will be used. Emphasis is placed on proportionality ratios.

Critical thinking component:

Most of the problems given in exams are conceptual exercises and require the students to understand the material and think over it in order to answer the questions.

LATE WORK & TEST POLICY

Late work:

10 points per day will be deducted from late lab results.

Missed tests:

There will be no make-up for missed quizzes or lab exams.

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.

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.

TOPICAL OUTLINE - include table, calendar, or topical outline with datesLecture Topic Schedule:

Date	Lecture		Date	Lecture		Date	Lecture
25-Aug	Ch 0-2		24-Sep	Ch. 4		3-Nov	Ch. 7
27-Aug			26-Sep			5-Nov	
29-Aug			29-Sep			7-Nov	
1-Sep	Labor Day		1-Oct	Exam 2		10-Nov	
3-Sep	Ch. 2		3-Oct	Ch. 5-6		12-Nov	Exam 4
5-Sep			6-Oct			14-Nov	Ch. 8-9
8-Sep			8-Oct			17-Nov	
10-Sep			10-Oct			19-Nov	
12-Sep	Exam 1		13-Oct			21-Nov	
15-Sep	Ch. 3		15-Oct			24-Nov	
17-Sep			17-Oct			26-Nov	
19-Sep			20-Oct			28-Nov	Thanksgiving
22-Sep			22-Oct	Exam 3		1-Dec	Ch. 10
		24-Oct			3-Dec		
		27-Oct			5-Dec		
			29-Oct	Ch. 6-7		TBA	Final Exam
			31-Oct				

Last day to drop the course without a "W" : September 10

Last day to drop the course and receive a "W" : October 1

Laboratory Schedule:

Week	Experiment Name
1	Safety/Check In
2	Formula Writing and Chemical Reactions
3	Density
4	Spectrophotometric Determination of Green Food Color
5	Percentage of Water in a Hydrate
6	Determination of the Acid Content of Vinegar
7	Acid-Base Neutralization
8	Boyle's Law
9	Gas Constant
10	Spectroscopic Determination of Copper
11	Enthalpy of Neutralization
12	Paper Chromatography
13	Redox Reaction
14	Molecular Shapes
15	Final Exam/Check Out

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

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.**