

**CHEMISTRY 1412: SYLLABUS**  
**GENERAL AND QUANTITATIVE CHEMISTRY II**  
**SPRING SEMESTER, 2015**

**Section 001 & 002 (Lecture), Sections 01L, 02L, 03L, 04L, 05L (Laboratory)**

**STUDENT CONDUCT:** Students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (see Student's Guidebook, Policies and Procedures, Conduct). Any student engaging in disruptive behavior will be dismissed from class on the first offence. A second offence will constitute dismissal from the course.

**COURSE TITLE:** General and Quantitative Chemistry II; 4 Semester Hours: 3 hours of lectures and 4 hours of laboratory per week. This course is part of the University Studies Core Courses and meets the criteria for laboratory science credits.

**COURSE CONTENT:** This is the second part of a two-course sequence of general chemistry. This course is designed primarily for students majoring in sciences or in pre-professional programs. The lecture covers the fundamental laws, theories, and descriptive aspects of modern chemistry. Critical thinking and problem solving skills will be emphasized in this course.

**PREREQUISITE:** The student must have completed Math 1314 and Chem 1411.

**INSTRUCTORS: Lecture:** Dr. Ben Jang, Sci 335, x5383, ben.jang@tamuc.edu

**Laboratory:** Dr. Ben Jang  
**Graduate Assistants:** TBD

**CLASS TIME & Lecture:**

**Section 001: MWF, 9:00 am–9:50 am, BA 340**

**Section 002: MWF 1:00-1:50 pm, STC 122**

**CLASSROOM: Laboratory:**

**Section 01L: M, 2:00-5:50 pm, STC 310**

**Section 02L: M, 2:00-5:50 pm, STC 311**

**Section 03L: W, 2:00-5:50 pm, STC 310**

**Section 04L: W, 2:00-5:50 pm, STC 311**

**Section 05L: W, 9:00am-12:50 pm, STC 311**

**ATTENDANCE POLICY:** All students are expected to attend classes on a regular basis. The Department of Chemistry adheres to the attendance policy set by the University as stated in the most current Undergraduate Catalog. The attendance record is kept by **roll call**. Being more than 5 minutes late or missing a daily quiz is equivalent to missing a lecture. Excessive absence is defined as missing more than 10% of the lectures or more than 10% of the laboratory sessions without excusable reasons. Excessive absence will be reported to the Dean of the College and the Dean of Students. In

addition, **according to the TAMU-Commerce Procedure A13.02, if a student has excessive absences, the instructor may drop the student from the course.** The instructor will only excuse an absence if the student provides, with appropriate documents an excusable reason allowed by the TAMU-Commerce Procedure A13.02. Regular class attendance is necessary in order to pass this course.

### **OFFICE HOURS:**

**Dr. Jang:** MWF: 10:00-11:00am & MW: 2:30-3:30pm.  
Messages can be left in the mailbox in the Department office.

### **REQUIRED TEXTBOOKS AND SUPPLIES:**

#### **Course Materials:**

Lecture textbook: **Chemistry, an atoms-focused approach**, by Thomas Gilbert, Rein Kirss, and Natalie Foster, (W.W. Norton and Co publisher) Hardcover ISBN: 978-0-393-91234-0 or Paperback: ISBN: 978-0-393-12419-4, or 3-hole punch version of the textbook: ISBN: 978-0-393-12420-0 or e-book version (Nortonebooks.com).

**Smartwork** (an online homework system). Should be available for free with textbook purchase or can be purchased directly as a stand-alone product.  
smartwork.wwnorton.com

Laboratory textbook: ***Experiments in General Chemistry***, 10th Edition, by R.A.D. Wentworth, published by Houghton Mifflin Company, New York, NY. ISBN: 9781111989422

A pair of SAFETY GOGGLES and a PADLOCK are required.

### **REQUIRED READING:**

The lectures in this course will cover Chapters 10-19 of the assigned textbook and will be presented at the rate indicated by the **Tentative Class Schedule**.

Be sure to read the textbook before coming to the lectures. The lectures will focus on important chemistry concepts but cannot be expected to serve as a substitute for the textbook. The textbook contains a more detailed presentation with a more extensive set of example problems. Chemistry is a physical science and it is imperative that you master chemical calculations in order to do well in this course.

**Read the experiment carefully before coming to lab.** A Pre-Lab assignment will be due at the beginning of each laboratory session. A Pre-Lab quiz will be given immediately after the Pre-Lab is collected. It is necessary to read and understand the concepts and procedure involved in the experiment before coming to lab. You will ***not*** be allowed to do the lab if you ***fail*** the Pre-Lab Quiz.

**Read the University Studies Philosophy.** Since Chemistry 1412 meets the University Studies criteria for a science requirement, all the basic elements required for a University Studies course will be included in this course through a variety of ways in both the lecture and laboratory components. You will be asked at the end of the semester to comment on the University Studies aspects of this course. Please read the attached University Studies Philosophy handout and the description of the university program in the most current catalogue.

### **HOMEWORK:**

The practice/homework assignments will be available on the SmartWork system. Please check your smartwork system often, so you are aware of the assignments and the due date. Questions similar to the practice/homework problems will be given on the exams. Some exam questions will also require you to show your work in order to obtain full credit.

### **HOUR EXAMINATIONS:**

Four 50-min Examinations will be given in this course. The Tentative Class Schedule lists the week for each of the examinations. The questions on these exams will be similar to those in the homework and practices. One of the tests will be dropped. No make-up exams will be given.

### **ACS STANDARDIZED EXAMINATION:**

In order to meet the accreditation standards of the Southern Association of Colleges and Universities, of which TAMU-Commerce is a member, the Chemistry Department has chosen to use the ACS Standardized Examination in this course as one of the criteria for the evaluation of the extent to which Chemistry 1411 and 1412 have achieved their objectives. The examination will be given at the end of the semester and will take about 110 minutes.

### **LABORATORY:**

There will be 13 experiments during the semester. A schedule of these experiments is provided in the Tentative Class Schedule. A Pre-lab Assignment will be due at the beginning of each laboratory session. A Pre-Lab Quiz will be given immediately after the Pre-Lab assignment is collected. Due to laboratory safety reasons, no one will be allowed in the laboratory without having turned in the Pre-Lab assignment and passed (60%) the Pre-Lab Quiz. The Post-Lab Report is due at the end of each laboratory.

Being absent from or late for the laboratory session without an excusable reason will result in a zero for the entire experiment. Those who miss the Pre-Lab Lecture often become a safety hazard in the laboratory and hence will not be allowed to enter the laboratory that day. If a Laboratory Report is turned in late, a deduction of one letter grade will be assessed for each day passed the due date. There will be no make-up

experiments. The lowest laboratory grade will be dropped. If you miss a laboratory then that will be the grade that is dropped. This course moves quickly and it is very important that you make every laboratory session and keep up with the laboratory assignments. At least 12 experiments must be completed in order to pass the course, otherwise, a grade of "F" will be given for the entire course.

Due to liability reasons, you must closely follow all the safety instructions in the laboratory or you will be dismissed from the laboratory or even be dropped from the class with a letter grade of "F". **Keep in mind that you must wear the safety goggles all the time as long as you are inside the laboratory.**

### **DISHONESTY:**

Cheating on examinations and any other in-class assignments will not be allowed. Any instance of cheating will result in a grade of "F" for that assignment and could result in dismissal from the course. Working together for the post-laboratory or any other take-home assignment is encouraged; however, after the discussion, you should work out the assignments by yourself. Freedom to discuss problems on the homework or post-lab report does not mean that you can copy answers word-for-word. There must be evidence that you worked the problem out on your own. Blatant plagiarism will result in a grade of "F" for the assignment. Proven offenders will be dismissed from this course with a grade of "F" assigned. The offender will be reported to the Dean of the College and the Dean of Students.

### **GRADING:**

The overall grade for the course will be computed as follows:

SmartWork Assignments = **15%** of total grade

Three out of four 50-min Examinations = **50%** of total grade

Lab Grade = **20%** of total grade (The average of 12 individual laboratory grades.)

Comprehensive Final Examination (ACS) = **20%** of total grade

### Numerical Grade . . . Letter Grade Equivalent

90-100	=	A
80-89	=	B
70-79	=	C
60-69	=	D
Less than 59	=	F

20% of the total grade comes from the laboratory portion of the course. The laboratories have each been scheduled to correlate with the lecture portion of the course. By working hard to understand the laboratory you should be able to reinforce your performance in the lecture portion and improve your overall grade.

### **ADDITIONAL INFORMATION:**

Read the Tentative Class Schedule carefully. This course moves at a very fast pace. In order to get through all the material, it is necessary to stay on schedule. Be diligent in keeping up with the required reading and homework assignments. Be prepared for the lecture quizzes and examinations. Make every effort to fully understand the laboratory experiments because they reinforce the material covered in the lecture.

Without a well-documented excusable reason as recognized by the TAMU-Commerce Procedure A13.02, no make-up work in any form will be allowed. Circumstances beyond those prescribed in the TAMU-Commerce Procedure A13.02 preventing a student from taking an examination or performing an experiment are extremely rare. If a student has missed a class, an un-excused absence will be recorded automatically unless an excusable reason is offered to the instructor explicitly. Guidelines for University recognized absences have been presented in TAMU-Commerce Procedure A13.02. The instructor may consult with the Office of the Dean of Students for borderline cases.

If the student has missed a class, even with an excusable reason, such student is still responsible for all the material covered in the class. In addition, such a student is also responsible for all the announcements made in the class. The student shall consult with one of the classmates as soon as possible for all missed information.

University policy for all other grades such as “X”, “W”, “DP”, and “DF” will firmly adhered to as outlined in the Undergraduate Catalogue. For a grade of “X”, the directions in the TAMU-Commerce Procedure A13.07 will be followed.

**A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.**

#### **Lecture Learning Outcomes / Course Objectives:**

1. Relate concentration to physical properties and chemical properties of materials, such as freezing point depression, osmotic pressure etc.
2. Basic understanding of thermodynamics and the determination of reactions if spontaneous or not.
3. Basic understanding of reaction rate calculation and determination reaction order.
4. Calculate the equilibrium concentration of given reaction under specific condition.
5. Write the complete notation of voltaic cells and calculate the cell potential.
6. Balance nuclear reactions and calculate the energy involved in the reactions

#### **Laboratory Course Objectives:**

1. Apply knowledge and skills to safely operate lab equipment and handle, utilize and dispose of chemicals and properly organize and return equipment at the end of experiments.

2. Apply knowledge and skills to obtain accurate data needed to complete the experiments.
3. Use chemical theories and principles to interpret and discuss data to draw sensible conclusions.
4. Apply the conclusions drawn from experiments to strengthen the concepts learned from lectures.
5. Work cooperatively with your team members to obtain data and complete lab reports.

### **Tentative Schedule of Chem 1412 Lectures and Labs**

WK 1	Chap 10	Properties of Gases Safety and check in
WK 2	Chap 10/11 Exp. 1	Properties of Gases/ Properties of Solutions Boyle's Law (simulation)
WK 3	Chap 11 Exp. 2(12A)	Properties of Solutions A Molar Mass from Freezing Point Depression
WK 4	<b>Exam #1</b> & Chap 12 Exp. 3	Thermodynamics Thermodynamics
WK 5	Chap 12/13 Exp. 4(18)	Chemical Kinetics Spontaneity
WK 6	Chap 13 Exp. 5(13)	Chemical Kinetics The Rate of an Iodine clock reaction
WK 7	Chap 14 Exp. 6(14A)	Chemical Equilibrium Le Chatelier's Principle
WK 8	<b>Exam # 2</b> & Chap 14/15 Exp. 7(14B)	Aqueous Equilibria Determining an Equilibrium Constant

### **Spring Break (March 15-21)**

WK 9	Chap 15 Exp. 8(17A)	Aqueous Equilibria A Solubility Product Constant
WK 10	Chap 16 Exp. 9(16A)	Coordination Compounds Equilibria with Weak Acids and Weak Bases
WK 11	Chap 17 Exp. 10(16B)	Electrochemistry An Acid-Base Titration Curve
WK 12	<b>Exam #3</b> Chap 17/18 Exp. 11(22A)	The Solid State Thermochemistry and Complex ions
WK 13	Chap 18 Exp 12 (19B)	The Solid State Electrochemistry
WK 14	Chap 19 Exp 13 (23)	Organic Chemistry Molecular Models of Organic Molecules
WK 15	<b>Exam #4</b> & Chap 19 Check out	Organic Chemistry
WK 16	Final	