

SAM HOUSTON STATE UNIVERSITY
DEPARTMENT OF CHEMISTRY
CHEMISTRY 1412 – General Chemistry II
Course Syllabus – Fall 2017

MEETING TIME

Lecture: Section 03 Chemistry and Forensic Science Building - CFS 103
 MWF 2:00 – 2:50 pm

INSTRUCTOR INFORMATION

Dr. Adrian Villalta-Cerdas

e-mail: axv067@shsu.edu

Office: CFS 114

Office hours: Tu 2-4 pm, Th 2-5 pm; stop by or other times by appointment.

Office phone: 294 – 2556

TEXTBOOK AND MATERIALS

- 1) Brown, LeMay, Bursten, Murphy, Woodward and Stoltzfus. Chemistry: The Central Science, 13th Edition (ISBN-13: 978-0321910417). Older editions are good too, but the 13th edition will be our reference book.
- 2) Calculator: recommended type is TI-30X.
- 3) Recommended (if available): portable computer device such as smart phone, iPad or small laptop for viewing PDF and PowerPoint files.
- 4) iClicker Remote, or iclicker App (“Reef Polling”) for smartphones.
- 5) Recommended websites:
 - a. <https://openstaxcollege.org/textbooks/chemistry>
 - b. http://preparatorychemistry.com/Bishop_Atoms_First.htm
 - c. <http://2012books.lardbucket.org/books/principles-of-general-chemistry-v1.0/>

COURSE DESCRIPTION

Overview

CHEM1412, General Chemistry II, is the second semester of a two-semester course that offers an introduction to the science of chemistry. Completion of CHEM1411 General Chemistry I is required. Moreover, CHEM1412 is designed assuming learners’ robust conceptual understanding of topics from CHEM1411 and competency in calculations related to them. Course participants are encouraged to identify and repair any conceptual or procedural weakness that may potentially affect their learning process (elementary algebra, basic calculations, use of significant figures, balancing of chemical equations, and stoichiometric calculation are among some of the most common procedural obstacles faced by students with inadequate General Chemistry I background).



In this course we will discuss topics that will advance our understanding of what drives chemical reactions, how they happen and the factors that influence their progress and their rates: Chemical Kinetics, Chemical Equilibrium, Free Energy and Thermodynamics, Acids and Bases, Aqueous Ionic Equilibria and Electrochemistry; chapters 10-23 (except 12, 18, and 22) of the textbook. These topics are fundamental in understanding the transformation of matter and how these processes can be controlled. We will strive to connect chemical structure and reactivity throughout the course. Additionally, we will introduce topics related to other types of transformations (Radioactivity and Nuclear Chemistry) and descriptive chemistry (Chemistry of the Nonmetals, Transition Metals and Coordination Compounds).

Class time and slides are not envisioned to summarize the content of the textbook or substitute independent study of the material. To fully take advantage of class, you will need to **do the assigned readings before class** (see Schedule below) and to participate actively during class. Class time will be used to discuss those aspects of the material that may be more challenging, and to address students' questions and comments. The design of this course is intended to create a collaborative learning environment where participants will interact and work together in small groups (3-4 members) for short periods during each class meeting. Besides being an effective learning strategy, group work in this class counts towards your in-class assignments grade (see Grading below).

Course Objective

This course will cover thermodynamics, kinetics, chemical equilibrium and the associated calculations, reduction-oxidation and electrochemistry, fundamentals of metal complexes and nuclear chemistry. This course intends to help you develop skills to process, analyze and synthesize pertinent chemical information and to draw inferences and make predictions about chemical systems. In addition to increasing your scientific knowledge base and your scientific reasoning skills, this course will help you enhance your ability to explain chemical phenomena based on scientifically sound principles.

Expected Learning Outcomes

After completing this course, students are expected to:

- Describe and explain the relationship between structure and reactivity.
- Develop interest in science, and in learning science and about science, and they will value scientific literacy for its impact on society.
- Develop critical thinking and problem-solving skills as applied to chemistry and science in general.
- Be able to interpret the chemical significance of new information and ideas acquired in the future.
- Develop and use teamwork abilities (among them communication).
- Be able to identify important resources for their own subsequent learning.



Instructional technologies

Blackboard: This class has its own Blackboard site. You are responsible for frequently checking the site for announcements and other information such as but not limited to homework assignments. I will report grades (quizzes, assignments, exams, etc) through Blackboard. You are responsible to verify the accuracy of the grades entered and for reporting errors to the instructor within one week of the posting date.

Email: The best way to reach the instructor outside class is via email. If you do not get a response within 48 hours, you should assume your email was not delivered and you should try to contact the instructor again. If the answer to your inquiry has been posted in Blackboard, you will be simply directed to our page. I welcome your emails; however, given the number of students in this class I ask you to make sure the answer to your question is not on Blackboard before emailing me.

Remote voting system: iClicker remotes must be purchased or reused from a previous class. Students will register their iClicker remote during lecture near the beginning of the semester under the guidance of the professor. iClicker questions are used in every lecture and points are received for both participation and correct answers using the iClicker remote. There is no make-up for clicker questions. We shall start using “clickers” the second week of classes; if you have any doubts please wait until after the first day of class. The iclicker app “Reef polling” will be available as well, so you can use your smart phone, tablet, or laptop during class.

Homework assignments: This course uses Blackboard to post homework assignments.

GRADING POLICY

Percentages are distributed as shown below. Letter grades are calculated from percentages according to the cutoff values shown below. **There is no extra credit in this course.**

Letter Grade	Final Average
A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	< 60%

A weighted percentage will be used to determine the overall course grade.

Homework	9%
In-class Assignments	9%
Exam 1	10%
Exam 2	13.5%
Exam 3	13.5%
Final Exam (comprehensive)	25%
Laboratory	20%



To pass this course with a **grade of A, B, or C**, I recommend **studying two hours for each hour spent in lecture**. Lecture will take three hours per week, so six hours of studying time (including reading, practice problems, and homework) will be necessary to successfully complete this course.

The laboratory portion of this course counts for 20% of the overall grade. In order to make a C or higher in this course (which is the prerequisite for CHEM 2323), you must earn at least a C in both the lecture portion of the course **AND** in the laboratory portion of the course. See your laboratory syllabus for details regarding the laboratory portion of the course.

EVALUATION ITEMS

In-class assignments: In-class assignments are intended to help you prepare for exams. Diligence in class typically saves time when studying for exams. Students are expected to come to class prepared and to actively contribute to the group discussions and group work. In-class assignments include: **(A) quizzes, (B) group work and (C) clicker questions**. These three items are weighted equally. (A) There will be between five and ten quizzes (may be unannounced), all weighted equally. (B) Students will form groups of three or four members; the composition of the groups is up to the students and may vary from class to class. Groups of less than three members or more than four will not receive credit. Each group will turn in a single worksheet at the end of most class days. Each student must sign their name clearly on this worksheet. I will collect at least eight worksheets over the semester. All worksheets are weighted equally. I will operate under the assumption that learners will not require excessive encouragement to actively engage in the discussions (If you think this may constitute an obstacle please see the instructor to discuss preventive/corrective strategies). (C) We will have clicker questions most class days. Failure to click because of lack of attention, tardiness or not having the device will lead to students not receiving credit for the day/question.

Homework assignments: Approach these assignments as a learning tool, not as chore. There will be **four homework assignments during the semester**. Each homework assignment will consist of a combination of multiple choice and short answer items. Deadlines will be posted on Blackboard and during class. Incomplete assignments will receive partial credit (only answered questions will be graded). No homework scores will be dropped. Final homework grade will be the average of all individual homework grades. **Late submissions are not accepted and extensions are not granted.**

Exams: Combination of multiple choice and short answer items; 45-50 minutes in length. For these exams you will need to bring: #2 pencils, eraser, **calculator (recommended type is TI-30X, and cannot use smart phone, tablet, or laptop)**. Please, arrive 5-10 min before test time. The most important concepts, as stressed primarily in the lectures and in the homework, will predominate in the exam material. You will not be allowed to bring any notes into the examination. Any information brought into the examination through notes, through programmable calculators or cell phones constitutes a violation of the university's policy of academic integrity (see below).

**ATTENDANCE POLICY**

Attendance to all class meetings is expected; **there is no credit associated with attendance.** Attendance will be taken via clickers. Attendance is not taken for credit but to advise students in case they are not performing at the level of their own expectations. Successful completion of this course will require attendance as you will be tested on material covered in class. Homework sets will also be based on material covered in class. I will try to accommodate extenuating circumstances. If you are absent due to an activity such as a conference, religious holiday, sport event, etc. you must inform me ahead of time. Students are responsible for all material covered during an absence. If missed, exams will only be made up under exceptional circumstances.

This course is designed to develop your critical thinking skills with regards to chemical processes. Expanding your critical thinking skills is a difficult task; the recommended path to success is working through problems. Be an active learner and participate in lectures and office hours. Please make sure that you understand how to work the homework problems for they will likely be on the examinations; ask for help if necessary.

COURSE SCHEDULE (*tentative*)

Week	Day	Date	Topic
1	1	23-Aug	Syllabus and Chapter 10: Gases
	2	25-Aug	Chapter 10: Gases
2	3	28-Aug	Chapter 10: Gases
	4	30-Aug	Chapter 10: Gases
	5	1-Sep	Chapter 11: Liquids and Intermolecular Forces
3	6	4-Sep	Labor Day (No Classes)
	7	6-Sep	Chapter 11: Liquids and Intermolecular Forces
	8	8-Sep	Chapter 11: Liquids and Intermolecular Forces
4	9	11-Sep	Chapter 13: Properties of Solutions
	10	13-Sep	Chapter 13: Properties of Solutions
	11	15-Sep	Exam 1 (Chapters 10, 11)
5	12	18-Sep	Chapter 13: Properties of Solutions
	13	20-Sep	Chapter 13: Properties of Solutions
	14	22-Sep	Chapter 14: Chemical Kinetics
6	15	25-Sep	Chapter 14: Chemical Kinetics
	16	27-Sep	Chapter 14: Chemical Kinetics
	17	29-Sep	Chapter 14: Chemical Kinetics
7	18	2-Oct	Chapter 15: Chemical Equilibrium
	19	4-Oct	Chapter 15: Chemical Equilibrium
	20	6-Oct	Chapter 15: Chemical Equilibrium
8	21	9-Oct	Chapter 15: Chemical Equilibrium
	22	11-Oct	Exam 2 (Chapters 13, 14)
	23	13-Oct	Chapter 16: Acid-Base Equilibria
9	24	16-Oct	Chapter 16: Acid-Base Equilibria
	25	18-Oct	Chapter 16: Acid-Base Equilibria
	26	20-Oct	Chapter 16: Acid-Base Equilibria
10	27	23-Oct	Chapter 17: Additional Aspects of Aqueous Equilibria
	28	25-Oct	Chapter 17: Additional Aspects of Aqueous Equilibria
	29	27-Oct	Chapter 17: Additional Aspects of Aqueous Equilibria



11	30	30-Oct	Chapter 19: Chemical Thermodynamics
	31	1-Nov	Chapter 19: Chemical Thermodynamics
	32	3-Nov	Chapter 19: Chemical Thermodynamics
12	33	6-Nov	Chapter 19: Chemical Thermodynamics
	34	8-Nov	Exam 3 (Chapters 15, 16, 17)
	35	10-Nov	Chapter 20: Electrochemistry
13	36	13-Nov	Chapter 20: Electrochemistry
	37	15-Nov	Chapter 20: Electrochemistry
	38	17-Nov	Chapter 21: Nuclear Chemistry
14	39	20-Nov	Chapter 21: Nuclear Chemistry
	40	22-Nov	Thanksgiving Holidays
	41	24-Nov	Thanksgiving Holidays
15	42	27-Nov	Chapter 23: Transition Metals and Coordination Chemistry
	43	29-Nov	Chapter 23: Transition Metals and Coordination Chemistry
	44	1-Dec	Review
16	45	4-Dec	Final Exam - Chapters 10-23 (except 12, 18, and 22): Monday 3:30 - 5:30 p.m.
17	--	11-Dec	Grades Due

UNIVERSITY POLICIES

Please follow the links below to review University Policies that apply to this course:

<http://www.shsu.edu/syllabus/>

<http://www.shsu.edu/dept/dean-of-students/policies/>

Academic Dishonesty

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. For a complete listing of the university policy, see: Dean of Student's Office <http://www.shsu.edu/dept/dean-of-students/index.html>.

Students with Disabilities

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and email disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.



SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: <http://www.shsu.edu/dotAsset/7ff819c3-39f3-491d-b688-db5a330ced92.pdf>

Student Absences on Religious Holy Days Policy

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: “a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20....” A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

<http://www.shsu.edu/dept/academic-affairs/documents/aps/students/861001.pdf>

Visitors in the Classroom

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

Notes

- The course syllabus is intended to provide students with basic information concerning the course. The syllabus can be viewed as a “blueprint” for the course; changes in the syllabus can be made and students will be informed of any substantial changes concerning exams, grading or attendance policy and/or changes to reading or homework assignments.