



Course	CHEM 1312: General Chemistry II
Professors	Gregg Dieckmann (Dr. D)
Term	Summer 2016
Meetings	MWF 11:30 am – 12:45 pm, SLC 2.303

Professor's Contact Information

Office Phone	972-883-2903
Office Location	BE 2.324
Email Address	Dieckgr@utdallas.edu
Office Hours	Wed 4:00 to 5:15 pm (SLC 2.303); Fri 10:00 to 11:00 am (my office) PLEASE feel free to stop by ANYTIME when my door is open
Other Information	Best way to contact me: email listed above or stop by my office; I don't read eLearning email

General Course Information

Pre-requisites, Co-requisites, & other restrictions	One year of high school chemistry and one semester of college general chemistry (e.g. CHEM 1311) are assumed.
Course Description	A continuation of CHEM 1311 treating solutions; chemical equilibrium, acids and bases, solubility; electrochemistry; organic chemistry; rates of reactions; and environmental, polymer, nuclear, and biochemistry.
Learning Outcomes	<u>Objectives</u> This course is the second of a two-course sequence. The goal of this course is to provide students with a working knowledge of how the basic concepts learned in CHEM 1311 apply to more complex chemical systems. The course focuses on the following: chemical equilibrium; rates of reactions; acid base chemistry, including buffer systems and acid/base titrations; electrochemistry; thermodynamics; nuclear chemistry; and basic organic chemistry concepts. Basic problem solving skills and critical thinking continue to be emphasized in this course. <u>Expected Learning Outcomes</u> Upon successful completion of this course, students will therefore: 1) be able to use their understanding of intermolecular attractive forces that determine the properties of the states of matter and phase behavior by predicting colligative properties and the characteristics of solutions 2) be able to use the basic concept of equilibrium in writing equilibrium constant relationships, determining whether equilibrium has been established, calculating equilibrium concentrations, and predicting the effects of concentration, pressure and temperature changes on equilibrium mixtures (LeChatelier's Principle) 3) be able to interpret experimental data (in both tabular and graphical form) by appropriately setting up and solving scientific problems using dimensional analysis with proper attention to scientific units and significant figures 4) be able to apply the concepts of equilibrium to (a) understand common inorganic reactions that occur in aqueous solutions (e.g. acid-base, solubility-precipitation and oxidation/reduction reactions); (b) understand how chemical equilibria depend on ΔH, ΔS and ΔG; and (c) determine standard and non-standard cell potentials and equilibrium constants from cell potential data for oxidation/reduction reactions 5) be able to demonstrate an understanding of the basic concepts of chemical kinetics, how rate and equilibrium properties are related, and how these topics relate to major scientific issues by utilizing this knowledge to solve kinetics calculations and evaluate reaction mechanisms
Required Texts & Materials	1. Textbook: <i>Chemistry: Atoms First, 2nd Edition</i> (Julia Burdge, Jason Overby); McGraw-Hill 2. course materials located on class site at eLearning: http://elearning.utdallas.edu/ 3. Calculator: TI-30X IIS (or TI-30X IIB) or TI-30Xa

Schedule & Academic Calendar

Class Period	Day	Date	Topic	Chapter
1	Mon	May 23	Course Introduction	13
2	Wed	May 25	Physical Properties of Solutions: heats of solutions; concentration units; temperature and pressure effects on solubility; colligative properties: boiling pt. elevation/freezing pt. depression,	
3	Fri	May 27		
	Mon	May 30	Memorial Day	
4	Wed	Jun 1	osmosis; colloids	13 (cont.)
5	Fri	Jun 3	Kinetics: collision theory; reaction rates; concentration vs. rate; concentration vs. time; dependence of rate on temperature; reaction mechanisms; catalysis	19
6	Mon	Jun 6		
7	Wed	Jun 8		
8	Fri	Jun 10		
9	Mon	Jun 13	Equilibrium: the concept and the equilibrium constant; equilibrium expressions;	15
10	Wed	Jun 15		
	Wed	Jun 15	Exam 1 (Chapters 13 and 19)	
11	Fri	Jun 17	using equilibrium to solve problems;	15 (cont.)
12	Mon	Jun 20	factors that affect equilibrium	
13	Wed	Jun 22	Acids and Bases: Bronsted acids/bases; molecular structure & acid strength; acid/base properties of water; pH scale; strong acids and bases; weak acids and K_a ; weak bases and K_b ; conjugate acid/base pairs; polyprotic acids; acidic/basic salts; acid/ base properties of oxides and hydroxides; Lewis acids and bases	16
14	Fri	Jun 24		
15	Mon	Jun 27		
16	Wed	Jun 29		
17	Fri	Jul 1		
	Mon	Jul 4	4th of July	
18	Wed	Jul 6	Acid/base equilibria and Solubility equilibria: common ion effect;	17
	Wed	Jul 6	Exam 2 (Chapters 15 and 16)	
19	Fri	Jul 8	buffer solutions; acid/base titrations; solubility equilibria; factors affecting solubility; separation of ions using differences in solubility	17 (cont.)
20	Mon	Jul 11		
21	Wed	Jul 13		
22	Fri	Jul 15		
23	Mon	Jul 18	Entropy, Free energy and Equilibrium: spontaneous processes; entropy and entropy changes; 2 nd and 3 rd laws of thermodynamics; predicting spontaneity and Gibb's free energy; free energy and equilibrium	14; 15.4
24	Wed	Jul 20		
25	Fri	Jul 22		
26	Mon	Jul 25		
27	Wed	Jul 27	Electrochemistry: balancing redox reactions; galvanic cells;	18
	Wed	Jul 27	Exam 3 (Chapters 17, 14, 15.4)	
28	Fri	Jul 29	cell potentials and reduction potentials; spontaneity of redox reactions; batteries; electrolysis	18 (cont.)
29	Mon	Aug 1		
30	Wed	Aug 3		
	Wed	Aug 3	Exam 4 (Chapter 18)	
31	Fri	Aug 5	Nuclear chemistry: nuclei/nuclear reactions; nuclear stability; fission and fusion	20
32	Mon	Aug 8		
	Wed	Aug 10	Final Exam (Cumulative)	

Exam Schedule:

Wed	Jun 15	Exam 1	4:00 to 5:20pm; SLC 1.102
Wed	Jul 6	Exam 2	4:00 to 5:20pm; SLC 1.102
Wed	Jul 27	Exam 3	4:00 to 5:20pm; SLC 1.102
Wed	Aug 3	Exam 4	4:00 to 5:20pm; SLC 1.102
Wed	Aug 10	Final Exam	2:00 to 4:45pm (NOTE DAY/TIME CHANGE); SLC 1.102

Course Policies

Grading (credit) Criteria	Course Evaluation: <table border="0"> <tr> <td>(i) Attendance</td><td>5%</td></tr> <tr> <td>(ii) In-class quizzes</td><td>15%</td></tr> <tr> <td>(iii) Midterm Exams (4 x 15%)</td><td>60%</td></tr> <tr> <td>(iv) Final Exam</td><td>20%</td></tr> </table> Our goal in this class is to help you develop an understanding (and appreciation) of how chemistry impacts your everyday lives. Our main focus will be on CONCEPTS and not just FACTS, and our teaching and testing will reflect this. We have designed this course to empower you to succeed in learning chemical concepts. We have a number of "resources" that we are putting at your disposal to enable you to succeed. While students will differ in the type of resources they prefer to utilize, in our experience we have identified a subset that are critical. Thus for those, we give credit in the class to strongly encourage students to use them. Resources are described below and in the following sections: 0. Homework assignments (end of chapter problems): • a principle method for assessing whether you understand a concept and how to use it • arguably the most critical resources for preparing for exams • assigned for each chapter from end-of-chapter exercises in your textbook • large number of problems selected to cover the majority of important concepts • mixture of conceptual and quantitative problems • <i>these will not be collected or graded</i> • all homework assignments are posted on eLearning 1. In-class quizzes: • will drop your 2 lowest scores; the others will be averaged together to give your in-class quizzes average • 1 quiz per day; will occur every day at the beginning of class • typically short (approx. 5 minutes, 1-2 questions) • there will be no makeup in-class quizzes given (<i>you will receive a "zero" for any you miss</i>); <i>the two drops will cover any excused/unexcused missed quizzes</i> 2. Attendance: • will drop 2 • student presence in last half of each lecture will be determined by TA • for each lecture, credit for attendance will be given if student (1) takes quiz at beginning of lecture AND (2) is present in last half of the lecture • obvious message: attending FULL lecture each and every day is among the most important things a successful general chemistry student does 3. Midterm exams (scantron-based multiple choice exams): • each exam is 80 minutes long—the 80 minutes INCLUDES time for filling out your scantron sheet (there will be NO extra time given to students beyond the 80 minutes to put information on the scantron) • ALL 4 MIDTERM EXAMS MUST BE TAKEN, at the scheduled time and on the scheduled day • There will be no makeup exams given • The lowest of the 4 exam scores will be automatically replaced by a higher final exam score. If you have an acceptable, documented reason for missing an exam (examples include: documented illness, auto accident, participation in UTD-sponsored event, observance of religious holiday), you will be allowed to replace the missed exam with your score on the final. Otherwise, you will receive a "zero" for that exam, that zero will not be replaced by the final, and will be included in the calculation of your final class grade • You may arrive late for an exam until the time when the first student finishes and leaves (only penalty being that you will have proportionally less time to finish the exam). After this grace period you will not be allowed to take the exam and will receive a score of "zero"	(i) Attendance	5%	(ii) In-class quizzes	15%	(iii) Midterm Exams (4 x 15%)	60%	(iv) Final Exam	20%
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	• questions will focus on concepts and material covered in class, homework assignments and in-class assignments 4. Final exam (scantron-based multiple choice exam): • comprehensive exam • the final exam is 2 hours and 45 minutes long • The final exam must be taken and cannot be replaced by any other grade, so • <i>No makeup final will be given. NOTE THE DAY AND TIME OF THE FINAL!</i>
Make-up Exams	There are no make-up exams (see above).
Extra Credit	There is no extra credit .
Class Attendance	Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. Absences may lower a student's grade (see "2. Attendance" in the Course Evaluation section above).
Exam/Final Exam Details	• Students will be assigned to specific exam rooms based on their last name. Assignments will be announced before the first midterm exam, and will be valid for the full semester. • you will need your valid COMET CARD to take the exam; in the absence of this, a valid, current photo ID such as your driver's license can be used • during exams, students are not allowed to have the following items with them: food or beverages, scratch paper (unless provided by the instructor), course materials, textbooks, notes (including formula sheets), or electronic devices, including iPads, iPhones or any other type of smart phone or cellular phone, iPods, MP3 players, earphones, radios, cameras, multi-functional timepieces, or computers. • when possible, students will sit in alternating seats, face forward at all times, and remove any clothing which might conceal eye movements, reflect images of another's work, or hide course materials for copying. • exam proctors will monitor any communication or signaling between students by talking, whispering or making sounds, or by using your hands, feet, or other body movements, the test paper itself or your writing implement. • We have a specific calculator (listed below) required for use on all exams - TI-30X IIS (solar) or TI-30X IIB (battery) or TI-30Xa -- NO OTHER CALCULATOR TYPE IS ALLOWED. -- ALL calculators will be checked before/during the exam. Non-approved calculators will be removed immediately from the student, to be returned at some point after the exam period (possibly in class) -- if your calculator is removed, you will be required to finish the exam WITHOUT a calculator (i.e., we do not have calculators to provide, and another student cannot provide you with a calculator once the exam has started)
Regrade Policy	Requests to have 1 or more questions of an exam regraded have to be made within 1 week of receiving the graded exam. The request should be in the form of an email from your UTD email account to the instructor; the subject line should read "exam X regrade", where X is the exam number; the body of the email should contain your full name, the problem number and an explanation of how the problem was graded incorrectly
UT Dallas Syllabus Policies and Procedures	The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus: http://go.utdallas.edu/syllabus-policies Policies covered include: student conduct and discipline, academic integrity, copyright notice, email use, student grievance procedures, and religious holy days. Some additional information regarding some of these topics is included in related sections below.
Academic Integrity	The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

	<i>Scholastic Dishonesty:</i> Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, submitting for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, or any act designed to give unfair advantage to a student or the attempt to commit such acts.
Email Use	Our policy in this class is to <i>not</i> communicate any details regarding your grade through email. We will only discuss these details in person with a student.
Technical Support	If you experience any problems with your UTD account, you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.
Withdrawal from Class	The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled. <i>Undergraduates last day to drop without a "W": Thurs Jun 2</i> <i>Undergraduates last day to withdraw with WL: Mon Jul 11</i>
Incomplete Grades	As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F .
Office of Student AccessAbility (OSA)	It is the policy and practice of The University of Texas at Dallas to make reasonable accommodations for students with properly documented disabilities. However, written notification from the Office of Student AccessAbility (OSA) is required. If you are eligible to receive an accommodation and would like to request it for a course, please discuss it with an OSA staff member and allow at least one week's advanced notice. Students who have questions about receiving accommodations, or those who have, or think they may have, a disability (mobility, sensory, health, psychological, learning, etc.) are invited to contact the Office of Student AccessAbility for a confidential discussion. The primary functions of the Office of Student AccessAbility are to provide: 1. academic accommodations for students with a documented permanent physical, mental or sensory disability 2. non-academic accommodations 3. resource and referral information and advocacy support as necessary and appropriate. OSA is located in the Student Services Building, suite 3.200. They can be reached by phone at (972) 883-2098, or by email at disabilityservice@utdallas.edu.

These descriptions and timelines are subject to change at the discretion of the Professor.