



Course	CHEM 1312: General Chemistry II
Professor	Bruce Gnade
Term	Fall 2013
Meetings	Section 001: MWF 9:00 am – 9:50 am, HH 2.402

Professor's Contact Information

Office Phones	972-883-6636
Office Locations	AD 3.210
Email Addresses	gnade@utdallas.edu
Office Hours	Mon and Wed. 12:00 (noon) – 2:00 pm in my office For all times: Feel free to stop by when my door is open
Other Information	Best way to contact me: email listed; I do not 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; entropy, free energy and nuclear chemistry.
Learning Outcomes	<p><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.</p> <p><u>Expected Learning Outcomes</u> Upon successful completion of this course, students will therefore:</p> <ol style="list-style-type: none">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 solutions2) 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 figures4) 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 reactions5) be able to use their understanding of intermolecular attractive forces that determine 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	<ol style="list-style-type: none">1. Textbook: <i>Chemistry, Atoms First</i> (Julia Burdge and Jason Overby); McGraw-Hill2. course materials located on class site at eLearning: http://elearning.utdallas.edu/

Schedule & Academic Calendar

Class Period	Day	Date	Topic	Chapter
1	Mon	Aug 26	Introduction, syllabus, grading, etc	
2	Wed	Aug 28	Solutions, heats of solutions, concentrations	13
3	Fri	Aug 30	Temperature and pressure effects of solubility	
	Mon	Sept 2	Labor Day – no class	
4	Wed	Sept 4	Colligative properties	13
5	Fri	Sept 6		continued
6	Mon	Sept 9	Kinetics: factors effecting reaction rates	
7	Wed	Sept 11	Concentration vs. rate	
8	Fri	Sept 13	Concentration vs. time	14
9	Mon	Sept 16	Reaction rate theories	
10	Wed	Sept 18	Activation energies, Mechanisms, Catalysis	
11	Fri	Sept 20	Equilibrium: concepts and equilibrium constant	15
	Mon	Sept 23	Exam 1 – Chapters 13 & 14	
12	Wed	Sept 25	Equilibrium expressions	15
13	Fri	Sept 27	Using equilibrium to solve problems	
14	Mon	Sept 30	Factors that affect equilibrium	
15	Wed	Oct 2	Acids and Bases	
16	Fri	Oct 4	Bronsted acids / bases: pH scale	
17	Mon	Oct 7	Strong / weak acids – bases; conjugate acids/bases	16
18	Wed	Oct 9	Molecular structure of acids/bases, acid/basic salts	
19	Fri	Oct 11	Lewis Acids and Basis	
	Mon	Oct 14	Exam 2 – Chapters 15 & 16	
20	Wed	Oct 16	Acid / base equilibria and solubility equilibria	
21	Fri	Oct 18	Common ion effect	
22	Mon	Oct 21	Buffer solutions	17
23	Wed	Oct 23	Acid / base titrations	
24	Fri	Oct 25	Solubility equilibria, factors effecting solubility	
25	Mon	Oct 28	Entropy, Free Energy and Equilibria	
26	Wed	Oct 30	Entropy	
27	Fri	Nov 1	Second and Third laws of thermodynamics	18
28	Mon	Nov 4	Gibb's Free Energy	
29	Wed	Nov 6	Free Energy and Equilibrium	
	Fri	Nov 8	Exam 3 – Chapter 17 & 18	
30	Mon	Nov 11	Electrochemistry	
31	Wed	Nov 13	Balancing redox reactions, galvanic cells	
32	Fri	Nov 15	Cell potentials and redox potential	19
33	Mon	Nov 18	Cell potentials and energy changes	
34	Wed	Nov 20	Electrolysis / Stoichiometry of electrochemical react	
35	Fri	Nov 22	Nuclear Chemistry, nuclear stability	20
	Mon	Nov 25	Fall Break	
	Wed	Nov 27	Fall Break	
	Friday	Nov 29	Fall Break	
36	Mon	Dec 2	Nuclear reactions,	20
37	Wed	Dec 4	Fission, fusion	continued
	Fri	Dec 6	Exam 4 – Chapter 19 & 20	
38	Mon	Dec 9	Organic Chemistry	24
39	Wed	Dec 11		

Exam Schedule:

Mon **Sept 23**
Mon **Oct 14**
Fri **Nov 8**
Fri **Dec 6**
Final Exam

Exam 1 **9:00 to 9:50am**
Exam 2 **9:00 to 9:50am**
Exam 3 **9:00 to 9:50am**
Exam 4 **9:00 to 9:50am**
To be determined

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Course Policies

Grading (credit) Criteria	<p>Course Evaluation:</p> <table><tr><td>(i) Quizzes</td><td>15%</td></tr><tr><td>(ii) Midterm Exams (4 x 15%)</td><td>60%</td></tr><tr><td>(iii) Final Exam</td><td>25%</td></tr></table> <p>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 problem solving, and not just FACTS, and our teaching and testing will reflect this. A principle method for learning a concept is by working problems that test your understanding of that concept and how it relates to other concepts you already know. We have designed this course to empower you to succeed in learning chemical concepts. Important components of the course are as follows:</p> <p>1. Homework assignments (end of chapter problems):</p> <ul style="list-style-type: none">• assigned for each chapter from end-of-chapter exercises in <i>Burdge and Overby</i>• large number of problems selected to cover majority of important concepts• these will not be collected or graded• all homework assignments for the next section will be posted the day after the previous exam <p>2. Quizzes (in class):</p> <ul style="list-style-type: none">• approximately one per chapter – date of quiz will be announced one day before• I will drop your 2 lowest quiz scores; the others will be averaged together to give your quiz average• there will be no makeup quizzes given (you will receive a “zero” for any quiz you miss) <p>3. Midterm exams:</p> <ul style="list-style-type: none">• each exam is 50 minutes long• 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 (e.g., 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 up until 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”• questions will focus on concepts and material covered in class, homeworks, and quizzes <p>4. Final exam:</p> <ul style="list-style-type: none">• 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 don't miss it• No makeup final will be given. NOTE THE DAY AND TIME OF THE FINAL!	(i) Quizzes	15%	(ii) Midterm Exams (4 x 15%)	60%	(iii) Final Exam	25%
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	GEMS Center PC Lab	The GEMS Center PC Lab supports science, technology, engineering and mathematics (STEM) learning through technology. See following link for more details, hours, etc.: http://www.utdallas.edu/GEMS/pclab/index.html					
Make-up Exams	There are no make-up exams (see above).						
Extra Credit	There is no extra credit .						
Class Attendance	Your attendance is CRITICAL for your ultimate performance in this class. Results from Fall 2006 support this statement: students that missed just 4 of the first 21						

	lectures ended up with D's, F's or withdrew from the course. Bottom line: DO NOT SKIP CLASS
Regrade Policy	Requests to have 1 or more questions of a quiz/exam regraded have to be made within 1 week of receiving the graded assignment. The request should be in the form of an email from your UTD email account to the instructor; the subject line should read, "quiz X regrade" or "exam X regrade", where X is the assignment number; the body of the email should contain your full name, the problem number and an explanation of how the problem was graded incorrectly
Calculators on Proctored Assignments	<u>Use of a non-approved calculator will be considered an act of scholastic dishonesty and will be dealt with appropriately (see Section "Academic Integrity" below).</u>
Student Conduct and Discipline	<p>The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, <i>A to Z Guide</i>, which is provided to all registered students each academic year.</p> <p>The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the <i>Rules and Regulations, Series 50000, Board of Regents, The University of Texas System</i>, and in Title V, Rules on Student Services and Activities of the university's <i>Handbook of Operating Procedures</i>. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at:</p> <p style="text-align: center;">http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html</p> <p>A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.</p>
Peer Instructional Support (PLTL Program)	<p>Peer Led Team Learning (PLTL) is a program designed to provide an active learning experience in which students can gain the skills and confidence to be successful learners in General Chemistry and other science courses. In weekly ninety-minute PLTL sessions, small groups of students will work together to solve problems written by the course professors. An undergraduate PLTL leader who has training in group dynamics and mastery of course content will lead them. This is an optional component to the course. However, if you choose to participate, you are required to stay in the program throughout the semester—the integrity of the group depends on it.</p> <p>It is critical to attend every session—skipping a PLTL session limits the utility of that session for everybody else. We want people who sign up for the program to be fully committed to attending. <i>You are allowed only 2 absences during the whole semester; students in the PLTL program that miss more than 2 PLTL sessions will not be allowed to drop their 2 lowest quiz grades. Bottom line: only sign up for PLTL if you are committed to attending every session.</i></p> <p>To participate in a PLTL group, you will need to apply online. More details of this program will be announced in class. You can learn more about PLTL and the GEMS Center at the following link:</p> <p style="text-align: center;">http://www.utdallas.edu/GEMS/</p>
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.

	<p>Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.</p> <p>Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.</p>
Copyright Notice	<p>The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provide by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UTD student, you are required to follow the institution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see:</p> <p>http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm</p>
Email Use	<p>The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's UTD email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at UTD provides a method for students to have their UTD mail forwarded to other accounts.</p> <p><i>Our policy is to not communicate any details regarding your grade through email. We will only discuss these details in person with a student.</i></p>
Technical Support	<p>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.</p>
Withdrawal from Class	<p>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.</p>
Student Grievance Procedures	<p>Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's <i>Handbook of Operating Procedures</i>.</p> <p>In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is</p>

	<p>final. The results of the academic appeals process will be distributed to all involved parties.</p> <p>Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.</p>
Incomplete Grades	<p>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.</p>
Disability Services	<p>The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m. The contact information for the Office of Disability Services is:</p> <p style="text-align: center;">The University of Texas at Dallas, SU 22; PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY); email: disabilityservice@utdallas.edu</p> <p>If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.</p> <p><i>It is the student's responsibility to notify his or her professors of the need for such an accommodation.</i> Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. <i>Individuals requiring special accommodation should contact the professor ASAP after class or during office hours.</i></p>
Religious Holy Days	<p>The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.</p> <p>The Student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.</p> <p>If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.</p>

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