Course	**CHEM 1312: General Chemistry II**
Professors	Gregg R. Dieckmann (Dr. D) and John W. Sibert
Term	Spring 2009
Meetings	Section 001: MWF 9:30 am – 10:20 am, HH 2.402 Section 002: MWF 10:30 am – 11:20 am, HH 2.402

Professor's Contact Information

Office Phones	Dr. D: 972-883-2903; Dr. Sibert: 972-883-2918
Office Locations	Dr. D: BE 2.522; Dr. Sibert: BE 3.520
Email Addresses	dieckgr@utdallas.edu and sibertj@utdallas.edu
Office Hours	LOCATION: Small office inside Success Center, Conference Center Dr. D: Mon 2:00 to 3:00 pm; Tues 11:00 am to noon Dr. Sibert: Tues 9:00 to 10:00 am; Wed 3:00 to 4:00 pm For both: PLEASE feel free to stop by "when our doors are open"
Other Information	Best way to contact us: email listed above or stop by our offices; we don't read WebCT 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	*Objectives* 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. *Expected Learning Outcomes* 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 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	1. Textbook: *Chemistry, 1st Edition* (Julia Burdge); McGraw-Hill 2. course materials located on WebCT at http://webct6.utdallas.edu/ 3. ARIS online assignment system (http://aris.mhhe.com)

Schedule & Academic Calendar

Class Period	Day	Date	Topic	Chapter
1	Mon	Jan 12	Introduction	
2	Wed	Jan 14	Solutions: heats of solutions; concentrations;	13
3	Fri	Jan 16	temperature and pressure effects on solubility;	
	Mon	*Jan 19*	*Martin Luther King, Jr's Birthday observed (No class)*	
4	Wed	Jan 21	colligative properties: boiling pt. elevation/freezing pt. depr,	13 (cont.)
5	Fri	Jan 23	osmosis	
6	Mon	Jan 26		
7	Wed	Jan 28	Kinetics: factors affecting reaction rates;	14
8	Fri	Jan 30	concentration vs. rate;	
9	Mon	Feb 2	concentration vs. time;	
10	Wed	Feb 4	reaction rate theories/activation energies;	
11	Fri	Feb 6	mechanisms; catalysis	
12	Mon	Feb 9	Equilibrium: the concept and the equlibrium constant;	15
	Tues	**Feb 10**	**Exam 1 (Chapters 13 and 14)**	
13	Wed	Feb 11	equilibrium expressions;	15 (cont.)
14	Fri	Feb 13	using equilibrium to solve problems;	
15	Mon	Feb 16	factors that affect equilibrium	
16	Wed	Feb 18	Acids and Bases:	16
17	Fri	Feb 20	Bronsted acids/bases; pH scale;	
18	Mon	Feb 23	strong/weak acids and bases; conjugate acid/base pairs;	
19	Wed	Feb 25	molecular structure and acid strength; acidic/basic salts;	
20	Fri	Feb 27	Lewis acids and bases	
21	Mon	Mar 2		
	Tues	**Mar 3**	**Exam 2 (Chapters 15 and 16)**	
22	Wed	Mar 4	Acid/base equilibria and Solubility equilibria:	17
23	Fri	Mar 6	common ion effect;	
24	Mon	Mar 9	buffer solutions;	
25	Wed	Mar 11	acid/base titrations;	
26	Fri	Mar 13	solubility equilibria	
		Mar 16-20	*Spring Break*	
27	Mon	Mar 23	factors affecting solubility	17 (cont.)
28	Wed	Mar 25	Entropy, Free energy and Equilibrium:	18.1 to 18.3
29	Fri	Mar 27	enthalpy review: entropy;	
30	Mon	Mar 30	second and third laws of thermodynamics;	
	Tues	**Mar 31**	**Exam 3 (Chapters 17 and 18.1 – 18.3)**	
31	Wed	Apr 1	Gibb's free energy and equilibrium	18.4 to 18.5
32	Fri	Apr 3		
33	Mon	Apr 6	Electrochemistry:	19
34	Wed	Apr 8	balancing redox reactions;	
35	Fri	Apr 10	galvanic cells;	
36	Mon	Apr 13	cell potentials and reduction potentials;	
37	Wed	Apr 15	cell potentials and free energy changes;	
38	Fri	Apr 17	batteries;	
39	Mon	Apr 20	electrolysis/Stoichiometry of electrochemical reactions	
40	Wed	Apr 22	Nuclear chemistry:	20
41	Fri	Apr 24	nuclear reactions; nuclear stability;	
42	Mon	Apr 27	fission and fusion	
	Tues	**Apr 28**	**Exam 4 (Chapters 18.4 – 18.5, 19 and 20)**	
43	Wed	Apr 29	Organic chemistry	10
44	Fri	May 1		
45	Mon	May 4		
	Tues/Wed	*May 5-6*	*Reading Days*	
	Tues	**May 12**	**Cumulative Final Exam (7 pm to 9:45 pm)**	

Exam Schedule:	**Tues**	**Feb 10**	**Exam 1**	**7 to 8:30pm**
	Tues	**Mar 3**	**Exam 2**	**7 to 8:30pm**
	Tues	**Mar 31**	**Exam 3**	**7 to 8:30pm**
	Tues	**Apr 28**	**Exam 4**	**7 to 8:30pm**
	Tues	**May 12**	**Final Exam**	**7 to 9:45pm (NOTE TIME CHANGE)**

Course Policies

Grading (credit) Criteria

Course Evaluation:

(i) Quizzes	15%
(ii) Midterm Exams (4 x 15%)	60%
(iii) Final Exam	25%

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. 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:

1. Homework assignments (end of chapter problems):

- assigned for each chapter from end-of-chapter exercises in *Burdge*
- 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

2. Quizzes (online in ARIS):

- one per chapter plus additional "Foundation Concepts" quizzes
- we 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)*
- each quiz will be composed of two parts:
  a. pre-quiz: -- approx. 5 to 10 questions (similar to homework)
     -- worth 25% of quiz score
     -- can take as many times as you want (top score counts)
     -- can take it anywhere you wish
     -- can work together, use notes and textbook
  b. proctored quiz:
     -- typically 3 to 5 questions
     -- similar to homework (and pre-quiz questions)
     -- worth 75% of quiz score
     -- only take once
     -- must take it independently (no working together, textbook or notes) at the Success Center (Conference Center, CN building)
- all quizzes for the next section will be posted the day after the previous exam, and all quizzes will be due (i.e. access closed) at 5:00 pm on the Tuesday of the exam; you are encouraged to work at your own pace. This will give you approximately 3 weeks to complete ALL pre-quizzes and proctored quizzes for a given section. ***There are 450+ students in this class, and ALL of you will be required to take the proctored quizzes at the Success Center (~40 computers). So don't wait until the last couple days before the exam to try to take your quizzes—there will be no excuses accepted for unfinished quizzes***
- you are required to take the proctored quizzes at the Success Center, and software on those computers track student access and usage to allow us to ensure this***. Any attempt by a student to take the proctored quiz at a different location will be considered an act of scholastic dishonesty and will be dealt with appropriately (see Section "Academic Integrity" on a following page).***

3. Midterm exams (scantron-based multiple choice exams):

- 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 homework, pre-quizzes and quizzes

4. Final exam (scantron-based multiple choice exam):

- comprehensive exam
- 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!***

Recommended Quiz Deadlines

All Prequizzes and Proctored Quizzes for a section of material are ***due 5:00 pm the day of the exam covering that material*** *("final deadline" listed in each section below)*—after 5:00 pm on those days these assignments will close and you will no longer be able to work on them. The deadlines listed below are *recommended* to help you spread out your work on ARIS so that you do not fall behind:

Recommended Date to Finish	Assignment	Topic
Section 1		
Jan 21	Quiz 1	IM forces, molecular geometry and polarity, Molarity, calculations using *log* and *ln*
Jan 30	Quiz 2	Chapter 13--Solutions
Feb 6	Quiz 3	Chapter 14—Kinetics
Feb 10	FINAL DEADLINE—Section 1	
Section 2		
Feb 18	Quiz 4	Calculations using quadratic equation, Strong/weak acids and bases
Feb 23	Quiz 5	Chapter 15--Equilibrium
Mar 1	Quiz 6	Chapter 16--Acids and Bases
Mar 3	FINAL DEADLINE—Section 2	
Section 3		
Mar 13	Quiz 7	Ionic reactions and solubility rules; acid/base stoichiometry, Enthalpy calculations (ΔH_{rxn}: Hess's Law, ΔH_f)
Mar 25	Quiz 8	Chapter 17--Acid/base equilibria and solubility equilibria
Mar 29	Quiz 9	Chapter 18.1-18.3--Entropy, free energy
Mar 31	FINAL DEADLINE—Section 3	
Section 4		
Apr 8	Quiz 10	Redox chemistry, 1^{st} order kinetics, basic atomic structure
Apr 22	Quiz 11	Chaps 18.4-18.5, 19--ΔG and equilibrium, Electrochemistry
Apr 26	Quiz 12	Chapter 20--Nuclear chemistry
Apr 28	FINAL DEADLINE—Section 4	

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***
ARIS details	**What:** McGraw-Hill's ARIS (Assessment, Review, and Instruction System) is an electronic homework and course management system that we will be using for online quiz assignments. **Where:** Go to http://aris.mhhe.com **First-time Registration/Create a New Account:** • procedure outlined in document "ARIS Quickstart.pdf" located on WebCT course site **Enrolling for Course:** • procedure outlined in document "ARIS Quickstart.pdf" located on WebCT course site • BE SURE TO USE THE CORRECT COURSE CODE FOR YOUR SECTION section 001 (Sibert): code = F6F-74-BDF section 002 (Dieckmann): code = 398-CF-744 • Be sure to use your first and last names that correlate with your UTD records so that we can associate your ARIS scores with your class grade
Student Conduct and Discipline	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, *A to Z Guide*, which is provided to all registered students each academic year. 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 *Rules and Regulations, Series 50000, Board of Regents, The University of Texas System*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. 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: http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html 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.
Peer Instructional Support **(SI/PLTL Programs)**	Two additional resources are available to facilitate your learning and development of study skills. Supplementary Instructors (SIs) are undergraduate students with mastery of course content. They will hold weekly tutorial sessions and exam reviews. Their hours and room assignments will be announced in class. Peer Led Team Learning (PLTL) is a new 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, potentially, future courses. In weekly ninety-minute

	PLTL sessions, small groups of students will work together to solve problems written by Drs. Sibert and Dieckmann. 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. PLTL groups will begin Wednesday January 21st. To participate in a PLTL group, you will need to complete the PLTL application form distributed in class. More details of this program will be announced in class.
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. 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. 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.
Copyright Notice	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: http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm
Email Use	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. ***My policy is to not communicate any details regarding your grade through email. I 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. ***Undergraduates last day to withdraw with WP/WF: Monday, Mar 16***

Student Grievance Procedures	Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*. 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 final. The results of the academic appeals process will be distributed to all involved parties. 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.
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**.
Disability Services	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: The University of Texas at Dallas, SU 22 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY) disabilityservice@utdallas.edu 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. ***It is the student's responsibility to notify his or her professors of the need for such an accommodation.*** Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. ***Individuals requiring special accommodation should contact the professor ASAP after class or during office hours.***
Religious Holy Days	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. ***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 before or 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. 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.

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