



Course	CHEM 1311: General Chemistry I
Professors	Gregg Dieckmann, John Sibert, Stephanie Taylor, Sumudu Wijenayake
Term	Fall 2016
Meetings	Section 001: MWF 9:00 am – 9:50 am, SLC 1.102 (Dr. Taylor) Section 002: MWF 10:00 am – 10:50 am, SLC 1.102 (Dr. Sibert) Section 003: MWF 11:00 am – 11:50 am, SLC 1.102 (Dr. Dieckmann) Section 004: MWF 1:00 pm – 1:50 pm, SLC 1.102 (Dr. Dieckmann) Section 005: MWF 2:00 pm – 2:50 pm, SLC 1.102 (Dr. Taylor) Section 006: TR 5:30 pm – 6:45 pm, ECSS 2.415 (Dr. Wijenayake)

Professor's Contact Information

Office Phones [972-883-XXXX]	Dr. Dieckmann: 2903; Dr. Sibert: 2918; Dr. Taylor: 6044; Dr. Wijenayake: 4817
Office Locations	Dr. Dieckmann: BE 2.324; Dr. Sibert: BE 3.520; Dr. Taylor: FN 3.308D; Dr. Wijenayake: BE 3.330B
Email Addresses	Dieckgr@utdallas.edu; Sibertj@utdallas.edu; StephanieM.Taylor@utdallas.edu; snw081000@utdallas.edu
Office Hours	Dr. Dieckmann: Mon 2:00 to 3:00 pm; Thurs 10:00 to 11:00 am Dr. Sibert: Mon 2:00 to 3:00 pm; Tues 2:00 to 3:00 pm Dr. Taylor: Fri 10:00 am to noon Dr. Wijenayake: Thurs 9:00 to 11:00 am For all: PLEASE feel free to stop by when we are in our offices
Other Information	Best way to contact us: email listed above or stop by our offices; we don't read eLearning email

General Course Information

Pre-requisites, Co-requisites, & other restrictions	One year of high school chemistry is assumed.
Course Description	Introduction to elementary concepts of chemistry theory. The course emphasizes molecular structure and bonding, chemical reactions, and the mole concept and its applications.
Learning Outcomes	<p><u>Objectives</u> This course is the first of a two-course sequence. The goal is to provide students with a working knowledge of the basic concepts of general chemistry needed for creative problem solving, as well as a background for advance chemistry and related science courses, and for laboratory applications. The course focuses on the following: the architecture of the atom; molecular structure and bonding; chemical reactions; thermochemistry; the mole concept and its applications; and the properties of solids, liquids and gases. Basic problem solving skills and critical thinking are also emphasized.</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 basic concepts in quantum theory and chemical bonding theory by predicting both the chemical properties (e.g. periodic trends, reactivities) and the electronic and 3-dimensional structures of representative compounds 2) 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 3) be able to demonstrate an understanding of the role of energy in physical changes and chemical reactions by predicting the direction and magnitude of energy changes and by performing thermochemical calculations 4) be able to demonstrate an understanding of the properties of gases by applying the gas laws and kinetic molecular theory to processes involving gases
Required Texts & Materials	<ol style="list-style-type: none"> 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. ALEKS online assessment and learning system: http://www.aleks.com 4. Calculator: TI-30X IIS (or TI-30X IIB) or TI-30Xa

Schedule & Academic Calendar

Class Period	Day	Date	Topic	Chapter
1	Mon	Aug 22	Introduction	
2	Wed	Aug 24	Atoms and the Periodic Table: atomic theory; structure of the atom; atomic number; mass number; isotopes; average atomic mass; mole and molar mass	2
3	Fri	Aug 26		
4	Mon	Aug 29		
5	Wed	Aug 31	Quantum Theory and Electronic Structure of Atoms: energy; light; atomic line spectra; Bohr model; quantum mechanics;	3
6	Fri	Sept 2		
	Mon	Sept 5	Labor Day (no classes)	
7	Wed	Sept 7	quantum numbers; atomic orbitals; electron configurations; periodic table	3 (cont.)
8	Fri	Sept 9		
9	Mon	Sept 12	Periodic Trends of the Elements: effective nuclear charge; periodic trends—atomic radius, ionization energy, electron affinity;	4
10	Wed	Sept 14		
11	Fri	Sept 16		
	Sat	Sept 17	Exam 1 (Chapters 2, 3, 4)	
12	Mon	Sept 19	electron configuration of ions; ionic radius	4 (cont.)
13	Wed	Sept 21		
14	Fri	Sept 23	Ionic and Covalent Compounds: Lewis dot symbols; ionic bonding; covalent bonding; molecular and structural formulas; empirical formulas; nomenclature; molecular and formula masses; % composition; molar masses; determination of empirical and molecular formulas	5
15	Mon	Sept 26		
16	Wed	Sept 28		
17	Fri	Sept 30	Representing Molecules: octet rule; electronegativity and polarity; Lewis structures and formal charges; resonance; octet rule exceptions	6
18	Mon	Oct 3		
19	Wed	Oct 5		
20	Fri	Oct 7	Molecular Geometry, IM Forces & Bonding Theories: VSEPR theory; molecular geometry & polarity; intermolecular forces; valence bond theory;	7 (excluding sect. 7.7)
21	Mon	Oct 10		
22	Wed	Oct 12		
23	Fri	Oct 14		
	Sat	Oct 15	Exam 2 (Chapters 5, 6, 7)	
24	Mon	Oct 17	hybridization; sigma and pi bonding	7 (cont.)
25	Wed	Oct 19		
26	Fri	Oct 21	Chemical Reactions: chemical equations; stoichiometry; limiting reactants; percent yield	8
27	Mon	Oct 24		
28	Wed	Oct 26		
29	Fri	Oct 28	Chemical Reactions in Aqueous Solutions: strong and weak electrolytes; precipitation reactions; acid-base reactions; oxidation-reduction reactions; concentration units; pH;	9
30	Mon	Oct 31		
31	Wed	Nov 2		
32	Fri	Nov 4		
	Sat	Nov 5	Exam 3 (Chapters 8, 9)	
33	Mon	Nov 7	gravimetric analysis and titrations	9 (cont.)
34	Wed	Nov 9		
35	Fri	Nov 11	Energy Changes in Chemical Reactions: energy/energy changes; thermodynamics; enthalpy; calorimetry; Hess's Law; standard enthalpies of formation; bond enthalpies; lattice energy	10
36	Mon	Nov 14		
37	Wed	Nov 16		
38	Fri	Nov 18	Gases: properties of gases; kinetic molecular theory; pressure; gas laws;	11
	Mon-Wed	Nov 21-23	Fall Break (no classes)	
	Thurs	Nov 24	Thanksgiving (no classes)	
	Fri	Nov 25	Thanksgiving Holiday (no classes)	
39	Mon	Nov 28	ideal gas equation; real gases; Dalton's law of partial pressures and mole fractions; reactions with gases	11 (cont.)
40	Wed	Nov 30		
41	Fri	Dec 2	Liquids and Solids: properties of liquids and solids;	12
	Sat	Dec 3	Exam 4 (Chapters 10, 11, 12)	
42	Mon	Dec 5	crystal structure; types of solids; phase changes; phase diagrams	12 (cont.)
43	Wed	Dec 7		
	Thurs	Dec 8	Reading Day	
	Fri	Dec 9	Cumulative Final Exam (8:00 to 10:45pm)	

Exam Schedule:

Sat	Sept 17	Exam 1	10:00 to 11:30am
Sat	Oct 15	Exam 2	10:00 to 11:30am
Sat	Nov 5	Exam 3	10:00 to 11:30am
Sat	Dec 3	Exam 4	10:00 to 11:30am
Fri	Dec 9	Final Exam	8:00 to 10:45pm (NOTE TIME CHANGE)

Course Policies

Grading (credit) Criteria	<p>Course Evaluation:</p> <table> <tr> <td>(i) In-class assignments</td><td>6%</td></tr> <tr> <td>(ii) ALEKS</td><td>14%</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> <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 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 extra emphasis in the class to strongly encourage students to use them. Resources are described below and in the following sections:</p> <p>0. Homework assignments (end of chapter problems):</p> <ul style="list-style-type: none"> • a principle method for assessing whether you understand a concept and how to use it • one of 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 • these will not be collected or graded • all homework assignments and keys are posted on eLearning <p>1. In-class assignments: (will drop the lowest score from this group)</p> <ul style="list-style-type: none"> • we will drop your lowest score; the others will be averaged together to give your in-class assignment average • obvious message: attending class each and every day is arguably the MOST important thing a successful general chemistry student does • these will be unannounced, and can occur anytime during any lecture • typically short • there will be no makeup in-class assignments given (you will receive a "zero" for any you miss) <p>2. ALEKS:</p> <ul style="list-style-type: none"> • helps a student strengthen their fundamental knowledge and identify what they don't understand • details for ALEKS provided in separate document • each student will get a unique set of questions tailored by the system to suit the student's preparation and understanding of the material • ALEKS will constitute 14% of your course score, broken down as follows: <ul style="list-style-type: none"> -- Completion Goals, 12 of 13 objectives, 10% -- Overall pie completion, 4% <p>3. Midterm exams (scantron-based multiple choice exams):</p> <ul style="list-style-type: none"> • each exam is 80 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 • There will be no early exams given (except in the case of an acceptable, documented reason as defined by University policy) • 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 	(i) In-class assignments	6%	(ii) ALEKS	14%	(iii) Midterm Exams (4 x 15%)	60%	(iv) Final Exam	20%
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	<p><i>finishes and leaves</i> (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”</p> <ul style="list-style-type: none">• questions will focus on concepts and material covered in class, homework, in-class assignments and ALEKS <p>4. Final exam (scantron-based multiple choice 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• <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 “1. In-class Assignments:” in the Course Evaluation section above).																																																								
ALEKS Deadlines	<p>ALEKS objectives are <i>due on the date listed below</i>—at the deadline time (11:59 pm), these objectives will close and you will no longer be able to improve your grade for that objective.</p> <table><thead><tr><th>Date Due</th><th>Objective #</th><th>Content</th><th>*Knowledge check after?</th></tr></thead><tbody><tr><td>Mon Aug 31</td><td>1</td><td>Atoms/periodic table</td><td></td></tr><tr><td>Mon Sept 7</td><td>2</td><td>Quantum theory</td><td>yes</td></tr><tr><td>Mon Sept 14</td><td>3</td><td>Quantum/periodic trends</td><td></td></tr><tr><td>Mon Sept 21</td><td>4</td><td>Periodic trends</td><td>yes</td></tr><tr><td>Mon Oct 5</td><td>5</td><td>Compounds/rep molecules</td><td>yes</td></tr><tr><td>Mon Oct 12</td><td>6</td><td>Molecular geometry</td><td></td></tr><tr><td>Mon Oct 19</td><td>7</td><td>Molec geometry/chem rxns</td><td></td></tr><tr><td>Mon Oct 26</td><td>8</td><td>Chemical reactions</td><td>yes</td></tr><tr><td>Mon Nov 2</td><td>9</td><td>Aqueous reactions 1</td><td></td></tr><tr><td>Mon Nov 9</td><td>10</td><td>Aqueous reactions 2</td><td></td></tr><tr><td>Mon Nov 16</td><td>11</td><td>Energy changes</td><td>yes</td></tr><tr><td>Mon Nov 30</td><td>12</td><td>Gases</td><td></td></tr><tr><td>Mon Dec 7</td><td>13</td><td>Liquids/solids</td><td></td></tr></tbody></table> <p><i>* you will be given a knowledge check after this objective’s deadline (before you can proceed to the next objective)</i></p>	Date Due	Objective #	Content	*Knowledge check after?	Mon Aug 31	1	Atoms/periodic table		Mon Sept 7	2	Quantum theory	yes	Mon Sept 14	3	Quantum/periodic trends		Mon Sept 21	4	Periodic trends	yes	Mon Oct 5	5	Compounds/rep molecules	yes	Mon Oct 12	6	Molecular geometry		Mon Oct 19	7	Molec geometry/chem rxns		Mon Oct 26	8	Chemical reactions	yes	Mon Nov 2	9	Aqueous reactions 1		Mon Nov 9	10	Aqueous reactions 2		Mon Nov 16	11	Energy changes	yes	Mon Nov 30	12	Gases		Mon Dec 7	13	Liquids/solids	
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Exam/Final Exam Details	<ul style="list-style-type: none">• 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, computers, or ANY device capable of accessing cellular or wireless networks.• 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.																																																								

	<ul style="list-style-type: none"> • 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)
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 lowest ALEKS objective grade. 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, and the enrollment procedure, will be announced in class. You can learn more about PLTL at the following link for the Student Success Center:</p> <p>http://www.utdallas.edu/studentsuccess/leader/pltl.html</p>
Other Assistance	<p>We have many other resources available to you in this class:</p> <ul style="list-style-type: none"> • Chemistry TA office hours (3rd floor SLC, outside TA offices) <ul style="list-style-type: none"> -- hours will be set in near future and posted online -- available for walk-in assistance • Chemistry Tutors provided by Student Success Center <ul style="list-style-type: none"> -- hours will be set in near future and posted online at Success Center website <p>http://www.utdallas.edu/studentsuccess/leader/tutors.html</p> <ul style="list-style-type: none"> -- available for walk-in assistance • Supplemental Instructors provided by Student Success Center <ul style="list-style-type: none"> -- hours will be set in near future and posted online at Success Center website <p>http://www.utdallas.edu/studentsuccess/leaders/si.html</p> <p>In short: with 5 instructors, an army of Chemistry TAs, PLTL, Chemistry Tutors and SIs, there should be NO STUDENT that cannot find help. Our goal is to put the resources in place to help every student that wants to succeed in a position where they can do so!</p>
Regrade Policy	<p>Requests to have 1 or more questions of an 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 “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</p>
UT Dallas Syllabus Policies and Procedures	<p>The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus:</p> <p>http://go.utdallas.edu/syllabus-policies</p> <p>Policies covered include: student conduct and discipline, academic integrity, copyright</p>

	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	<p>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> <p><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.</p>
Email Use	Our policy in this class is to not 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	<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> <p><i>Undergraduates last day to drop without a "W": Wed Sept 7</i> <i>Undergraduates last day to withdraw with WL: Thurs Oct 27</i></p>
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)	<p>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.</p> <p>The primary functions of the Office of Student AccessAbility are to provide:</p> <ol style="list-style-type: none"> 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. <p>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.</p>

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