

Structure - Chemistry 121

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In this course I hope to introduce you to the fundamentals of chemistry and structure. As an introductory course which is only the first step in a multi-course sequence, the material we cover will not present a complete picture of chemistry. The picture will by necessity focus on inorganic chemistry (rocks, minerals, salt, etc.) and specifically the topics of bonding and structure. Some time will be spent on stoichiometry, chemical equations and equilibrium effects as well. There will be no biochemistry, organic chemistry (chemicals that make you live and breathe like DNA, proteins, sugars, etc.) and only minimal physical chemistry in this course; these topics will wait for later in your careers (though I am happy to discuss any chemistry topic outside of class if you have the interest.) What does all this mean to you as a student? Hopefully, it means you will have a better understanding of what makes your car run (combustion reactions), how Crystal Drano works (acid/base chemistry) or be able to differentiate a diamond (molecular crystal) and a salt (ionic crystal). Maybe you'll get a feel for what makes a reaction generate heat or how that heat can be used to do work. In addition, I hope you are left with a feeling for the evolution of atomic theory and some understanding of the complexities of quantum mechanics.

We meet Monday, Wednesday and Friday in Room 106 at 10:00 am. I will hold 9 office hours where I will guarantee normally to be available in my office unless otherwise posted. These will be Monday from 9-10, Wednesday from 9-10 and 1-2, Friday 9-10, Tuesday from 9-11 and 1-2, and Thursday from 9-11 and 1-2. Any other times that my door is open I am available for questions or comments. The laboratory for this course will be in room 313 and meets from 2-5 on Monday afternoons (10-40 minute prelab lecture will be in room 106). Note that the laboratory sessions are **not** optional and you are expected to attend both the prelab and subsequent laboratory sessions.

The grading policy will be based on the following schedule. You will be required to hand in homework problem sets (see last page of syllabus for complete assignments and due dates) which will be worth account for 90 points (10 points each). These will be graded primarily based on completion of the assignment (2/3 of grade) and accuracy of solutions (1/3). There will be 10 laboratory experiments worth 150 points (15 points each). Laboratory notebooks will be graded based on completeness (did you answer all the questions, did you conduct the experiment, did you interpret your data) rather than quantitative accuracy (this can wait until CHM241). There will be three one hour long tests worth 360 points (120 points each). *The tentative test days will be Monday, September 30th; Monday, November 4th; and Friday, December 6th.* There will be a final exam worth 200 points on *Thursday, December 19th at 3pm.* Tests will be graded very objectively for accuracy of answers. Normally each test will have about 1/3 multiple choice questions to help you prepare for the future when you will take MCAT,

LSAT, GRE which are entirely multiple choice. As well there will be some fill in the blank, short essay and word problems on these exams. There will be quizzes given most days (20 quizzes) which will consist of a single short question and will account for 100 points (5 points each). You will also be expected to maintain a study-log notebook which will be turned in each Friday (12 times) worth 96 points (8 points each). The study log will be graded 1/2 on completion (did you do a minimum of turning in a sheet of paper each Friday) and 1/2 on substance (did you work problems, ask questions, use appropriately as defined below). The grading will be such that 100-92% is an A (minimum 917 points), 91-78% is a B (minimum 777 points), 77-63% is a C (minimum 628 points), 62-50% is a D (minimum 498 points) and anything less is an F.

Assignment	Points each	Total Points
Homework (9)	10	90
Laboratory Write-ups (10)	15	150
Midterm Exams (3)	120	360
Quizzes (20)	5	100
Final Exam	200	200
Study Log (12)	8	96
Grand Total		996

The textbook used for this course is *Chemistry: The Central Science*, 6th Ed., by Brown, LeMay and Bursten. The laboratory manual is Berea's own and may be found at the college bookstore. In addition you will need a laboratory notebook (bound and lined, do not bring use a spiral bound notebook for laboratory), spiral-bound 100 page notebook with perforated pages (this will be used for the study log described below, I will give you 2 carbons for making duplicate copies), laboratory splash goggles, laboratory apron (no shorts or sandals permitted in lab), permanent-ink pen, and a scientific calculator (might find at Wal-Mart, etc.) Upper division chemistry majors will offer tutoring (as part of their labor assignments) on some of the evenings in room 401; times and dates will be announced later.

The attendance policy shall be that all labs must be completed, including laboratory write-ups. Also, it is expected that you attend all lectures. Up to two days may be missed without excuse, any subsequent absences will lead to a grade reduction of 15 points for each additional missed day (for example, if you skip class a total of 8 times, you would lose $6 \times 15 = 90$ points). Absence shall not be an excuse for failure to learn information covered in the course examinations. In cases involving extended absences for a good reason (for example hospitalization, emergency at home, etc.) a special arrangement will be made between us as to how to make up the missed material or exams.

The previously mentioned study journal will consist of the following items: a log of time spent studying chemistry each day (this includes total time, problems worked, confusing terms, and material

read), a log of questions encountered in the reading (this is a minimum of one question per lecture period), and examples of non-homework problems you work. You might say, why work a non-homework problem? The answer is that the homework I assign represents the minimum work I think you should do but the maximum I have time to grade. You certainly should always be doing more problems than just those assigned. Notice in the text that I assign less than 1/5 of all the problems in the book, is that an accident? The grading of study time/quality will be based on honesty of reporting rather than quantity. The questions and homework problems will be based on quantity as well. You are expected to do both but what you do is left to your discretion. This journal is meant to be an aide in your college learning experience. You will maintain a duplicate journal using carbon copies (I get a carbon copy of each page you write, but you keep original). The hope is you can see how you use your time in studying for this course and perhaps look for ways you can improve your time management. Also it will encourage you to take notes as you read the book. Reading a textbook is a lost art form to many students. You should sit with the book and notebook side-by-side and write notes in your journal as you read. You hit a question, write it down. You want to work an example, do it in the study log. This approach is good for ANY class, not just chemistry. You will find that the journal takes the place of that dreaded highlighter and your comments will be far more valuable than a lot of yellow lines and scribbled notes in the textbook. I cannot promise this approach will work the best for you, but I am requiring you to give it an honest effort.

Chemistry 121 Lecture/Homework Schedule

Lecture 1-3	Introduction: Some Basic Concepts HW 1.4, 1.7, 1.11, 1.16, 1.22, 1.28, 1.36, 1.47, 1.54	Chapter 1 Due Sept. 13th
Lecture 4-6	Atoms, Molecules and Ions HW 2.4, 2.8, 2.15, 2.20, 2.22, 2.36, 2.38, 2.48, 2.55	Chapter 2 Due Sept. 20th
Lecture 7-10	Stoichiometry: Calculations with Formulas HW 3.1, 3.4, 3.9, 3.12, 3.14, 3.22, 3.32, 3.34, 3.38, 3.44, 3.56, 3.65, 3.70, 3.71	Chapter 3 Due Sept. 30th
Examination 1		September 30th
Lecture 12-16	Aqueous Reactions HW 4.6, 4.8, 4.13, 4.19, 4.24, 4.29, 4.40, 4.36, 4.44, 4.50, 4.56, 4.69	Chapter 4 Due Oct. 18th
Lecture 17-19	Thermochemistry HW 5.1, 5.6, 5.12, 5.16, 5.26, 5.32, 5.35, 5.41, 5.49, 5.54, 5.64, 5.74	Chapter 5 Due Oct. 25th
Lecture 20-23	Atomic Structure HW 6.2, 6.8, 6.15, 6.20, 6.25, 6.28, 6.33, 6.38, 6.46, 6.54, 6.61, 6.81	Chapter 6 Due Nov. 4th
Examination 2		November 4th
Lecture 25-26	Periodic Properties HW 7.2, 7.7, 7.13, 7.16, 7.22, 7.32, 7.42, 7.50, 7.57, 7.64	Chapter 7 Due Nov. 15th
Lecture 27-30	Chemical Bonding HW 8.8, 8.13, 8.15, 8.20, 8.26, 8.33, 8.39, 8.44, 8.47, 8.52, 8.57, 8.64, 8.77	Chapter 8 Due Nov. 22th
Lecture 31-36	Molecular Geometry HW 9.3, 9.7, 9.12, 9.14, 9.17, 9.23, 9.27, 9.31, 9.34, 9.38, 9.45, 9.52, 9.65	Chapter 9 Due Dec. 4th
Examination 3		December 6th
Lecture 38-39	Review Study Journals and other course materials	
Final Examination		Thursday, December 19, 3 PM