

Structure - Chemistry 121

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In this course I hope to introduce you to the fundamentals of chemistry. 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 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 10 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 and prelaboratory assignments worth 160 points (16 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 390 points (130 points each). *The tentative test days will be Monday, September 29th; Friday, November 14th; and Monday, December 8th.* There will be a final exam worth 200 points on *Thursday, December 17th 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 attend two of the six scheduled chemistry seminars (Thursday afternoons or evenings, September 25th, October 16th, 23rd and 30th, November 6th, or December 4th) and write a short (1 page, double spaced 12 point times font) essay on what was discussed in the seminar worth 60 points (30 points each). You will be graded based upon the quality and organization of your writing and not upon technical substance (you don't have to fully understand all the presented science.) The grading for the course will be 100-92% for an A (minimum 920 points), 91-79% for a B (minimum 790 points), 78-63% for a C (minimum 630 points), 62-50% for a D (minimum 500 points) and anything less getting an F.

Assignment	Points each	Total Points
Homework (9)	10	90
Laboratory Write-ups (10)	16	160
Midterm Exams (3)	130	390
Quizzes (20)	5	100
Final Exam	200	200
Chemistry Seminars (2)	30	60
Grand Total		1000

The textbook used for this course is *Chemistry: The Central Science*, 7th 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), 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.

Chemistry 121 Lecture/Homework Schedule

Lecture 1-3	Introduction: Some Basic Concepts HW 1.10, 1.23, 1.36, 1.49, 1.50, 1.57, 1.61, 1.66, 1.73	Chapter 1 Due Sept. 12th
Lecture 4-6	Atoms, Molecules and Ions HW 2.4, 2.14, 2.18, 2.21, 2.32, 2.43, 2.63, 2.67	Chapter 2 Due Sept. 19th
Lecture 7-10	Stoichiometry: Calculations with Formulas HW 3.4, 3.10, 3.15, 3.20, 3.28, 3.41, 3.46, 3.58, 3.61, 3.90	Chapter 3 Due Sept. 29th
Examination 1		September 29th
Lecture 12-16	Aqueous Reactions HW 4.7, 4.12, 4.16, 4.20, 4.27, 4.34, 4.47, 4.54, 4.61, 4.74	Chapter 4 Due Oct. 15th
Lecture 17-19	Thermochemistry HW 5.4, 5.8, 5.13, 5.19, 5.30, 5.38, 5.46, 5.62, 5.71, 5.78, 5.88	Chapter 5 Due Oct. 24th
Lecture 20-23	Atomic Structure HW 6.7, 6.12, 6.17, 6.26, 6.32, 6.46, 6.48, 6.57, 6.61, 6.69, 6.87	Chapter 6 Due Nov. 3rd
Lecture 24-26	Periodic Properties HW 7.12, 7.15, 7.24, 7.33, 7.38, 7.50, 7.59, 7.75	Chapter 7 Due Nov. 12nd
Lecture 27-28	Chemical Bonding (not for test)	Chapter 8
Examination 2		November 14th
Lecture 30	Chemical Bonding (continued) HW 8.6, 8.13, 8.22, 8.28, 8.36, 8.44, 8.47, 8.54, 8.61, 8.69, 8.92	Chapter 8 Due Nov. 21st
Lecture 31-36	Molecular Geometry HW 9.8, 9.13, 9.19, 9.26, 9.32, 9.37, 9.44, 9.54, 9.73	Chapter 9 Due Dec. 5th
Examination 3		December 8th
Lecture 38	Review course material	
Final Examination		Wednesday, December 17, 3 PM