CHM 211 - Principles of Chemistry I – Spring 2012

(MWF 10:00- 10:50, Section 202, CRN 2500)

Attendance at Exams is Required (see below)
Required Text: Brown, LeMay, Bursten and Murphy, Chemistry: The Central Science, 11th edition
Strongly Recommended: Scientific Calculator
Prerequisite: ACT Math 21, or SAT Math 500, or a C or better in CHM 111 which requires MTH 127 or 130.
Instructor: Dr. Lawrence R. Schmitz; **Office Hours**: M, W, F: 11:00 – 12:00; T, Th: 10:00 – 11:00
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APPROXIMATE LECTURE AND EXAM SCHEDULE

Date	Chapter	Topic
Jan. 9, 11,13	1	Introduction: Matter and Measurement
Jan. 18, 20, 23	2	Atoms, Molecules, and Ions
Jan. 25, 27, 30, Feb. 1	3	Stoichiometry
Feb. 6	**1-3**	**EXAM I (Chapters 1-3)**
Feb. 3, 8, 10, 13	4	Aqueous Reactions and Solution Stoichiometry
Feb. 15, 17, 20	5	Thermochemistry
Feb. 24	**1-5**	**EXAM II (emphasizing Chapters 4-5)**
Feb. 22. 27, 29	6	Electronic Structures of Atoms
March 2, 5, 7	7	Periodic Properties of the Elements
March 9, 12, 14	8	Basic Concepts of Chemical Bonding
March 16	**1-8**	**EXAM III (emphasizing Chapters 6-8)**
March 26, 28, 30	9	Molecular Geometry and Bonding Theories
April. 2, 6, 9	10.1 – 10.5	Gases
April 13	**1-10.5**	**EXAM IV part 1 (emphasizing Chapters 9–10.5)**
April. 11, 16	10.6 – 10.9	Gases
April 18, 20, 23	11	Intermolecular Forces, Liquids and Solids
April 25	1-11	**EXAM IV part 2 (emphasizing Chapters 10.6-11)**
April 27	**1 - 11**	Review
April 28	1-11	**FINAL EXAM (Chapters 1-11) (Saturday 9:50 AM)**

COURSE OBJECTIVES

1. To introduce students to the vocabulary, concepts, and intellectual machinery of chemistry.
2. To introduce the students to various kinds of problem solving as applied to chemistry and science in general. Particularly to show how to approach problems in some depth and to start to develop the discipline needed to work complex, multistep problems.
3. To encourage the students to develop the "habits of successful students".

Catalog Description: Principles of Chemistry I. 3 hrs. I, II, S.
A study of the properties of materials and their interactions with each other. Development of theories and applications of the principles of energetics, dynamics and structure. Intended primarily for science majors and pre-professional students. 3 lec. (PR or CR: CHM 217; PR: MTH ACT of 21 or better or C or better in CHM 111)

Course Policies:
This course will be conducted adhering to university policies. Copies of these policies can be found at: http://www.marshall.edu/academic-affairs/?page_id=802
Academic dishonesty will not be tolerated. Students engaging in academic dishonesty will be sanctioned as per the university policy.
Attendance at exams is required. Make up exams will only be given for university excused absences as defined in the policy.
Students with disabilities will be accommodated in accordance with university policy.

Problems: The culmination of the studying process in chemistry is working problems. Working problems is also the culmination of the testing process. Therefore, it is very important that you learn to work problems. To assist you in learning to work problems, I am providing a list of suggested problems below.

Chapter 1: 1, 2, 5, 11, 17, 24, 26, 29, 31, 33, 35, 39, 43, 45, 49
Chapter 2: 1, 11, 17, 25, 27, 31, 32, 37, 39, 47, 51, 57, 59, 65, 67
Chapter 3: 1, 5, 11, 12, 13, 18, 19, 21, 25, 27, 33, 35, 39, 43, 47, 51, 57, 59, 71, 77
Chapter 4: 15, 18, 21, 23, 30, 31, 37 43, 49, 51, 53, 61, 64, 67, 70, 73, 77, 82, 85
Chapter 5: 5, 12, 13, 18, 24, 25, 27, 30, 35, 38, 41, 45, 48, 51, 54, 57, 61, 63, 67, 71, 83
Chapter 6: 2, 3, 13, 15, 22, 23, 26, 33, 36, 39, 44, 45, 49, 50, 52, 54, 63, 65, 68, 71
Chapter 7: 13, 23, 26, 28, 32, 38, 42, 45, 47, 52, 61, 67, 71, 73, 77
Chapter 8: 9, 12, 15, 24, 34, 35, 37, 40, 43, 45, 46, 49, 52, 55, 61, 67, 69
Chapter 9: 15, 20, 21, 23, 26, 33, 38, 39, 41, 43, 49, 51, 53, 56, 60, 61
Chapter 10: 4, 5, 9, 19, 23, 25, 28, 30, 33, 35, 37, 40, 46, 53, 63, 66, 75, 77, 86
Chapter 11: 2, 12, 16, 17, 20, 31, 34, 37, 44, 48, 53, 55, 58, 60, 61, 71

There are too many problems and too many students in the course for me to collect and grade these problems. Therefore, it is up to you to show the responsibility to work the problems. To encourage you to do this I often put some of the homework problems on exams. Please work the problems. If you have trouble doing the problems, please see me for help.

Grading Policies

Lawrence R. Schmitz

There will be four exams and a final in this course. You may earn points towards your grade on these exams. If you failed to successfully complete the assigned homework you can lose points. The final exam will be counted as two hour exams and your lowest grade will be dropped in determining your average. Your average score for the course will be calculated as shown below:

Average Score = {Exam1 + Exam2 + Exam3 + Exam4 + [2*(FinalExam)] - LowestExam} / 5.

The "LowestExam" can be one of the hour exams or the final. Note that the final exam will be 1/5 (20%) of your grade if you do poorly on it, but 2/5 (40%) of your grade if you do well. **Attendance at exams is required. Make-up exams will only be given for university excused absences as defined by university policy.** Make-up exams will be given on Monday, May 4, 2009. Students with university excused absences wishing to take a make-up exam should inform me via email during the last week of classes that they intend to take a make-up exam. A score of zero will be recorded for unexcused missed exams.

My exams tend to vary in degree of difficulty. This can cause problems in determining which exam is indeed your poorest. For example, suppose I give you an exam and that I determine that you need 90% correct to get an A on this exam. Assume that you get 85% correct, a B grade. Suppose that the next exam is much harder than the first. Because of this, I determine that 80% correct is an A. Further suppose that you get 82% correct on this exam, an A grade. The situation is then as shown below:

Exam	%Correct	Grade
1	85	B
2	82	A

Which exam should be dropped? Obviously, these exams need to be put on a common basis.

Therefore, I have developed a scaling technique to help overcome this problem. The mathematics of this technique is described later. After I apply this technique, you will receive a scaled score. Your average score (as described above) will be determined using the scaled scores from each exam. Your grade for the course will be the highest grade possible based on the criteria below:

Average Scaled Score	Grade
≥ 90	A
≥ 80	B
≥ 70	C
≥ 60	D
< 60	F

The Mathematics of Scaling

After you are given an exam, I will grade the exams and determine a raw score for each individual in the class. Based on my judgment of the difficulty of the exam and of what level of performance is necessary to receive a given grade, I will determine what is the minimum score necessary to receive an "A" and what score is the minimum "C". If everyone performs exceptionally well, I will be happy to the draw the A line in a position such that everyone will receive an A. At the other extreme, if the performance of all individuals is very poor I will draw the lines in a way that reflects this. Your grades are, therefore, actually determined by my judgment of your performance.

In order for the scaling technique to be in agreement with the 90, 80, 70, 60 grading criteria given above, I make two boundary conditions. The lowest A must scale to a 90 and the lowest C must scale to a 70. My scaling technique is linear and as such is based on the equation for a straight line ($y = mx + b$). In this case the equation is:

$$\text{ScaledScore} = (m * \text{RawScore}) + b$$

where m and b are constants not yet determined. To determine the two scaling constants, I apply the two boundary conditions to yield the following equations:

$$90 = (m * \text{LowestA}) + b$$
$$70 = (m * \text{LowestC}) + b$$

By subtracting the second boundary equation from the first and solving for m, you will see that:

$$m = 20 / (\text{LowestA} - \text{LowestC}).$$

You can then substitute the now known value of m into the first boundary equation to obtain:

$$b = 90 - (m * \text{LowestA}).$$

At this point, your raw score and both m and b are known. Therefore, you can determine your scaled score [ScaledScore = (m * RawScore) + b]. If you have occurred any penalty points for failing to complete your homework on time, they will be subtracted from your scaled score.

When you take an exam, I will do all this math for you. When I return the exam to you, there will be both a raw score and a scaled score on the exam. **It will be very easy to determine how you did on an exam. Just look at the scaled score and remember the 90, 80, 70, 60 grading criteria.** The raw score is there so you can check to see that I added up your score correctly. I will also announce the values of the Lowest A, Lowest C, m and b, so you can check my math if you like. You should also check the grading of each problem and let me know if you have any questions or grievances.