CHEM 111

Fall 2006
Instructor: Lecture: Daniel A. Kleier, 414 Stratton Hall, tel. 215 895 1861; email: dak48@drexel.edu
Textbook - "Fundamentals of General, Organic, and Biological Chemistry", sixth ed. by John Holum.

"Handouts" will be given out at various times during the term. It is your duty to come to class to obtain them.
Office Hours: Thursday at 10:30 AM to 12:30 PM.

Place and time of lecture: In Stratton 113, Monday, Wednesday and Friday at 10:00 to 10:50

Prerequisites: basic high school algebra

Course Description: Introduces the principles of general chemistry. Covers SI units, unit factor calculations, states of matter, elements and compounds, energy, atoms, electronic configurations, ionic and covalent bonds, Lewis dot structures, shapes of molecules, chemical equations, stoichiometry, molarity, gas laws, nuclear chemistry, equilibrium between different states of matter, and some colligative properties of solutions.
The **objective** of this course is an introduction to some basic principles of general chemistry.

Study lecture notes, "hand outs", and the textbook for the exams. You must learn and understand formulas discussed in lecture unless otherwise noted. Some formulas and constants may be provided as supplementary material with exam question sheets.

Exam 1- Tentative Monday October 23 at 10:00 AM (subject to change - To be announced in class). The material covered will be announced in class. (all topics from the beginning the course)
Exam 2- Tentative Wednesday November 15 at 10:00 AM (subject to change - To be announced in class). The material covered will be announced in class. (all topics from the end of the first exam to this date)
Final Exam- to be announced by SRC. It covers the complete term.
For your Final grade: Exams 1 and 2 count 25% each and the final exam counts 50%.

Tentative grading scheme
A+ = above 96, A = 92 to 96, A− = 88 to 92,
B+ = 84 to 88, B = 80 to 84, B− = 76 to 80,
C+ = 70 to 76, C = 64 to 70, C− = 58 to 64,
D+ = 54 to 58, D = 50 to 54,
F = below 50.

Missed Exam. You are expected to attend the exams as scheduled. Make-up exams will not be given. If you miss one or both of the hour exams, the final exam will be upweighted commensurately to determine your final grade.

All students are responsible for bringing to the exam their own operational writing instruments and calculators - no sharing will be allowed. Be aware, that active cell phones and the use of random-access devices (e.g., MP3 players, active cell phones, Palm Pilots, iPods) are NOT ALLOWED in exam rooms, and such may be confiscated if they are found. You are <u>not allowed</u> to use any notes or other prerecorded memory aids during the exam. <u>Remove</u> any papers or notes from your calculator case.

Students are held to the highest expectations and standards regarding honesty in all aspects of the course, including taking exams and quizzes. Cheating, including misrepresentation of the work of others as your own, will not be tolerated. Cases of cheating will be reported to the University and the College of Arts and Sciences. Students caught cheating will receive a failing (F) grade.

You are expected to attend class, and exams.
The last day to withdraw from a course is Friday Nov. 3 of the sixth week of classes.

The main **Topics** are listed below. However the material is not Iimited.to these topics and others will be added in class. The classes will have both **lecture and problem solving**.

Problems are at the end of the Chapters. **<u>At least</u> do the <u>bold underlined</u> problems**.

Chapter 1: **<u>12</u>** 14 **<u>18 19</u>** 22 25 **<u>27 28 30 31 33 34 35 36 37 39 40 43 49ab</u>** **<u>58b</u>**d 59ah **<u>62 65 66 68</u>** 70 **<u>72a 74</u>** 79 **<u>89 93</u>** (SI units, measurements, density Significant figures. scientific notation, unit factor method of calculation).

Chapter 2: 1a 3 **5 7** 8 **9** 11 **12 14 16** 17 20b **21 27** 28 29 **34 39b 43 44** 45 **46bd** 47 **48 49 50 51a** 52 54 57 **58** 59 **62 68 70a** 74 read only (States of matter, atoms, symbols of elements, chemical equations, Law of multiple proportions, Law of definite proportions, Law of conservation of matter and energy, potential and kinetic energy, and heat)

Chapter 3: **6 9 11** 12 14 **16abg 17 18 20abd** 22 **23 25 27 28** 30b 31 **32 33 37 40 41** 46 48a **49** 52 **54bd** (Nucleus of the atom, isotopes, orbitals and their energy levels, electronic configuration and the periodic table)

Chapter 4: **1 3 5 6 7 8a to k** 11 **12 13 16 17 18** 19 20 23abc 26 **31 37 38 39** 40 **41abcjl 42abik 43abc** 46 47 48 50 **52 55bcd 57 58 59** 60 61 **62 63 65** 68 69 70 71 76aceg **80 83 87 89** (read 99) **100 105 106** (octet rule, electron transfer and ionic covalent bonds, Lewis dot structures for atoms and molecules, electronegativity, polarity of covalent bonds, and shapes of molecules)

Chapter 5: 6 **9 11fb 15fb l6fb 17** 18 19 **23abe 25 29 31 32a 36 42a 46 55 67** 70b (read only 51 53 54 59 69) (molar mass, moles, Avogadro's number, number of molecules, balancing equations, stoichiometry and calculations, solutions, molarity, and dilution)

Chapter 6: 5 11 12 **16a 21 23 2S 27 31** 35 **36** 39 40 **41 45 48 49** 50 **51 52** 53 **54 56cd 57 59** 61 **62a 66 69 70 75 80 83** (Gaseous states, pressure, gas laws - Boyle's, Charles', Dalton's, and ideal, kinetic theory of gases, vapor pressure, and equilibrium, solids and liquids, hydrogen bonding)

Chapter 7: 2 **3 5 8 10 11** 12 14 20 **26** 30 **32 33a 44 47 51 52 58 59** (solutions, colloids, solvation of ions in water, liquid and supercritical carbon dioxide, Henry's Law, " the bends", concentration expression, Colligative Properties- boiling point elevation, freezing point lowering and osmosis, osmotic pressure and reverse osmosis fresh water from sea water, hemodialysis)

Chapter 8: **1, 2, 8, 9, 16, 20, 27, 29, 32, 34, 38, 44, 57, 58, 59, 60, 63, 68, 70, 71 a-k**
electrolytes, acids and bases, salts, reaction of active metals with water

If time permits some of the following topics may be covered -they will be announced in class if covered.

Chapter 9: rates of reactions and factors affecting them. kinetic theory of rates, law of equilibrium, titration, buffers acid min.

Chapter 10: **6 7 8 9 10** 11 12 **14 15 17 18 22 24 25 27** 42 50 51 **52 54 55** 56 **57 61 62** 65 **67 68 69** 72 **80 85** (nuclear chemistry, radioactive decay- alpha, beta, and gamma, half lives, nuclear fission in reactors and bombs, fusion, fallout, and uses)

Chapter 8: electrolytes, acids and bases, salts, reaction of active metals with water

Chapter 9: rates of reactions and factors affecting them. kinetic theory of rates, law of equilibrium, titration, buffers acid min.

RECITATION

Instructors:

Gordan Reeves Section 002 on Tuesday @ 1:00 PM in Stratton 219,
Section 003 on Monday @ 11:00 AM in Stratton 101,
Section 004 on Tuesday @ 3:00 PM in Randell 238B

Matt Rossi Section 001 on Wednesday @ 2:00 PM in CAT 268;
Section 005 on Monday @ 11:00 AM in Curtis 352,
Section 006 on Thursday @ 11:00 AM in TBA

Snow closing for Drexel: phone 215-895-melt, or see Drexel Web page or KYW Radio 1060 AM.