**Course Description Format:**

Tuesday: New information is presented in lecture/demonstration mode.
Monday and Wednesday: Workshop based on either the lecture from the previous Tuesday or as a pretest for the next Tuesday lecture. Work initially will be done in teams of 3 with possible reformation into groups of 6 during September by the Integrated Curriculum Faculty.

You are expected to read the Chapter assignment before coming to workshops on Monday and Wednesday. There will be a brief assignment (made at the previous class) collected at each Workshop session. There could be unannounced individual quizzes at the beginning of some Monday and Wednesday classes. These are graded as Pass/Fail. Any failure will count as a 5-point deduction from the attendance grade.

Recitations: Individual Quiz at the end of the period based on the homework assignment and/or class activities. Individual homework assignments are collected only at the beginning of recitation. If you are late you will lose the homework points. Homework will be collected individually.

**Introduction**

Chem 0960 reviews some concepts of atomic structure, stoichiometry, and chemical bonding which you might have had in high school.

In addition, there will be some naming of compounds, types of chemical reactions, properties of gas, liquid, and solid states, and an introduction to chemical equilibrium. **EMPHASIS IS PLACED ON INTEGRATION OF CONCEPTS, CRITICAL THINKING SKILLS, AND PROBLEM SOLVING.**

**Course Rationale**

Although there will be specific learning objectives provided for all topics we discuss, there are a few transcending goals to keep in mind.

1. There are many chemical principles that you must learn well because of their application to future problems as well as present situations and technologies such as ozone depletion, catalytic converters, and air bags.
2. Keep in mind the overall impact of electronic structure of atoms and the nature of chemical bonds on the properties of matter.
3. Practice the art of integrating basic principles from one unit of chemistry to another as well as from one discipline to another. Try to avoid learning in discrete segments. At least you must develop the skill of seeing the relationships among these segments. As an example, the shapes of molecules depend on electronic arrangements and the shapes determine the polarity which determines many physical properties such as boiling point.
4. Try to develop an appreciation for the power of thermodynamics which predicts if a chemical reaction is feasible, how much energy it might produce; for kinetics which looks at how fast reactions occur, why, and whether or not the pathway might be altered; for chemical equilibrium which involves the extent a reaction moves from left to right or vice-versa.
5. Application and relationship of Chemistry to Engineering and other disciplines will be done via the assigned reading and writing from sources outside of the textbook. Please note that applications of Chemical Principles to Engineering demand a thorough understanding of these principles. Our curriculum has been designed with this belief as the core philosophical element.
Course Materials

2. Use the learning objectives as a guide to the lecture presentations.
3. Use the solutions manual to check methods to solve homeworks and unassigned problems you do for practice.
4. Use sample quizzes and sample exams for insight into how the instructor poses questions. DO NOT EXPECT SAMPLE QUIZZES AND EXAMS TO BE DUPLICATES OF THE ACTUAL QUIZZES AND EXAMS. Rather, these are meant to stimulate your thinking and uncover conceptual flaws before the testing occurs.
5. Additional Handouts will occasionally be given in class. PLEASE CONDITION YOURSELF TO CHECK THE ANNOUNCEMENTS VIA COMPUTER AND/OR PROJECTION SCREEN AS YOU ENTER THE CLASSROOM. THERE WILL BE A LIST OF ACTIVITIES AND HANDOUTS. THE HANDOUTS WILL BE ON THE FRONT DESK. TAKE ONE!! I will not bring these to the next class. If you miss one of these ask Mary in 107 Chevron to see if any copies remain.

Course Requirements and Grading

Grading:
Quizzes (Recitation) 100 points
Exam One 100 points
Exam Two 100 points
Homework 20 points
Writing 50 points
Attendance 30 points
Final Exam 200 points
Total Points 600 points

Recitations:
These provide you opportunity to ask questions on assigned homework. A brief quiz will be given each week except as noted in the quiz schedule section. The lowest quiz grade will be dropped. Quiz questions will often reflect homework material but can also include lecture information. Homeworks will be collected and evaluated for completeness. DO YOUR HOMEWORK IN PENCIL. DURING RECITATION YOU MAY AMEND OR COMPLETE HW, BASED ON THE INSTRUCTOR'S ANSWER OR EXPLANATION, IN PEN ONLY. YOUR INSTRUCTOR WILL COLLECT HW JUST BEFORE THE QUIZ. The minimal expectation is that you attempt all assigned problems.

Attendance:
I expect you to attend every class. I have built an attendance bonus into the grading scheme. Note that I will deduct 5 points from this bonus for any missed class or recitation. Chronic lateness will count as an absence for each occurrence. There are no "make-up" quizzes and no "make-up" exams unless you are on official university business or produce a certified medical or personal excuse. I need to know beforehand to permit such excuses. I will be the sole arbiter-not the TA. Please pick up returned exams at the class immediately following that exam. This is the only time exams will be returned. I do not return exams during office hours.

Students missing Exam 1 or 2 will receive a score for that exam based on the score on the questions from those chapters on the final.

Students missing any quiz will receive zero for the missed quiz.
Excused Absences:
Only serious family or medical emergencies and official university business (athletics, forensics, etc.) warrant absence. To be excused from an assignment you must email me (lenk@pitt.edu), call me (4-2879), or see me in person before the assignment, quiz, exam, etc. Studying for an exam in another course is not an acceptable excuse. I will deal with problems as these arise on an individual basis. Please feel free to contact me and discuss any situation hindering your academic progress or ability.

Grading Scale:
To earn an A you need to compile over 539 points.
To earn a B you need to compile over 479 points.
To earn a C you need to compile over 419 points.
To earn a D you need to compile over 359 points.

I reserve the right to invoke a grading scale somewhat lower than that above. I will not raise the requirements, however.

Course Policies G-Grades:
For this course, a G-Grade will be granted if the student has taken one exam. The G-Grade allows two additional terms to complete course work.

Academic Integrity:
Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an examination, including dictionaries and programmable calculators.

Disabilities:
If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and the Disability Resources and Services no later than the 2nd week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call 648-7890 (Voice or TDD) to schedule an appointment. The Office is located in 216 William Pitt Union.

Course Schedule
1.08/25 M: Program Introduction
2.08/27 W: Course Introduction
3.08/26 T: Chapter 1: Matter and Measurement
4.09/01 M: Holiday
5.09/03 W: Workshop
6.09/02 T: Chapter 2: Atoms, Molecules, and Ions
7.09/08 M: Workshop
8.09/10 W: Workshop
9.09/09 T: Chapter 3: Chemical Calculations
10.09/15 M: Workshop
11.09/17 W: Workshop
12.09/16 T: Chapter 4: Reactions in Aqueous Solution
13.09/22 M: Workshop
14.09/24 W: REVIEW
15.09/23 T: Chapter 5: Thermochemistry
16.09/29 M: REVIEW
17.10/01 W: Workshop
18.09/30 T: EXAM 1(Chapters 1-5)
19.10/06 M: Workshop
20.10/08 W: Workshop
21.10/07 T: Chapter 6: Electronic Structure
22.10/13 M: Workshop
23.10/15 W: Workshop
24.10/14 T: Chapter 7: Periodic Properties
25.10/20 M: Workshop
26.10/22 W: Workshop
27.10/21 T: Chapter 8: Chemical Bonding
28.10/27 M: Workshop
29.10/29 W: Workshop
30.10/28 T: Chapter 9: Molecular Geometry
31.11/03 M: Review
32.11/05 W: Review
33.11/04 T: EXAM 2(Chapters 6-9)
34.11/10 M: Workshop
35.11/12 W: Workshop
36.11/11 T: Chapter 10: Gases
37.11/17 M: Review
38.11/19 W: Workshop
39.11/18 T: Chapter 11: Intermolecular Forces
40.11/24 M: Workshop
41.11/26 W: Thanksgiving Recess
42.11/25 T: Chapter 13 Solutions
43.12/01 M: Workshop
44.12/03 W: Review
45.12/02 T: Review/Catch-up

Final Exam: Monday, 12/8 from 12:00 PM to 1:50 PM (Room to be determined)

*T is Tuesday. All lectures are given on Tuesday.

**QUIZ SCHEDULE**

The lowest quiz grade will be dropped. There will be no quiz during the weeks of Exam 1, Exam 2, and Thanksgiving.

1.8/29 Introduction
2.9/5 Quiz 1: Chapter 1
3.9/12 Quiz 2: Chapter 2
4.9/19 Quiz 3: Chapter 3
5.9/26 Quiz 4: Chapter 4
6.10/3 No Quiz
7.10/10 Quiz 5: Chapter 5
8.10/17 Quiz 6: Chapter 6
9.10/24 Quiz 7: Chapter 7
10.10/31 Quiz 8: Chapter 8
11.11/7 No Quiz
12.11/14 Quiz 9: Chapter 9
13.11/21 Quiz 10: Chapter 10
14.11/28 No Quiz
15.12/5 Quiz 11 Chapter 11

**These are the Friday dates of the quiz week. Homework for Chapter 1 is due at the recitations ending the week of September 6.

Recitation Schedule

The Recitations for this course are listed below. Please go only to your scheduled section.

1. Tuesday (11:00-11:50AM) Conor McCutcheon in 135C
2. Tuesday (11:00-11:50AM) Stephanie Todaro 209C
3. Tuesday (1:00-1:50AM) Conor McCutcheon in 319A
4. Tuesday (1:00-1:50AM) Stephanie Todaro in 300E
5. Wednesday (8:00-8:50PM) Stephanie Todaro in 206C
6. Thursday (10:00-10:50AM) Stephanie Todaro in 206C
7. Friday (8:00-8:50AM) Stephanie Todaro in 521B
8. Friday (10:00-10:50AM) Stephanie Todaro in 521B

A is Allen Hall
B is Benedum Hall
C is Chevron Hall
E is Old Engineering Hall

How to Study
Link to File (171520 Bytes)

Writing Assignments

There will be 5 individual writing assignments. These writing assignments will be based on reading assignments from Chemical and Engineering News, Scientific American, The Journal of Chemical Education, and similar sources. Each student will submit a 2 page (minimum) opinion piece based on the assigned reading. These will be typed (word processor) and possibly submitted via disk or digital drop box on Wednesday dates to be announced. The purposes of these reading/writing assignments are to:

1. Relate chemistry to other disciplines, especially engineering and environmental/public policy problems
2. Keep students aware of ongoing discoveries and new topics outside the course curriculum
3. Develop critical thinking and analysis among students
4. Enhance writing skills in technically related areas

There are guidelines and procedures to follow:

1. Put your name, MW meeting time, Student ID #, and Title of the Article on the cover page.
2. Begin each article with a short Introduction/Abstract-no more than 20% of the total assignment. In the Main Section students will relate the article content to course material or provide opinion or commentary. The Main Section should constitute 75% of the assignment. Label each of the 3 individual sections with a header (Abstract; Main
In the Conclusion students will write a maximum of 2 sentences about the key point of the article.

3. Each written assignment will be graded on a 10-point maximum basis. The total of these assignments will comprise the 50 points counting for the final course total for writing. Grading will be based on both content and adherence to procedure.

**Meeting Times**

CRN 32145: MW 9:00-9:50 AM Workshop (GSCC) and Tuesday 8:00 - 9:50 AM (Benedum Auditorium)

CRN 32154: MW 11:00-11:50 AM Workshop (GSCC) and Tuesday 8:00 - 9:50 AM (Benedum Auditorium)

Also see the recitation schedule.

**Homework Answers by Chapter**

Homework_Solutions_Ch_112.doc (145408 Bytes)

These will be completed and revised in the near future.

**Homework**

8/29* Ch 1 (7,23,30,37,50,58,62,64,72,79)

9/5* Ch 1 (7,23,30,37,50,58,62,64,72,79)

9/12 Ch 2 (3,8,12,17,24,37,41,48,49,55, 57,60,64,78)

9/19 Ch 3 (3,5,14,17,24,29,34,45,55,60, 68,71,77,103)

9/26 Ch 4 (5,10,11,16,21,28,29,39,42,46, 51,59,73,76)

10/3 Ch 5 (19,23,33,38,41,44,49,52,57,62, 72,77,85,110)

10/10 Ch 6 (6,9,11,22,27,34,37,41,44,47,56, 61,66,85)

10/17 Ch 7 (3,16,19,26,35,40,52,63,73,95)

10/24 Ch 8 (7,16,22,29,35,38,45,47,50,57,61,80)

10/31 Ch 9 (7,11,16,19,26,28,31,33,38,43, 46,57,74,83)

11/14 Ch 10 (6,15,18,19,22,27,29,32,49,51, 54,67,70,79,104)

11/21 Ch 11 (7,8,19,23,25,29,32,39,41,50, 55,59,63,70,76,90)
12/5 Ch 13 To be assigned.

*Friday Date-These HW problems are due during the week ending on these dates.

I have also revised my office hours following consultation with the CQI group. Please see the Announcement Section.

M and W: 10:00-10:50 AM and 1:00-2:30 PM
Tues: 1:00-3:00 PM