HOUSTON COMMUNITY COLLEGE SOUTHWEST
COURSE OUTLINE FOR CHEM 1412 - GENERAL CHEMISTRY II
Spring, 2004
Class Number 24229

**Time and location**
8:00-11:00 AM Tuesday and Thursday, room W121 (Lecture, Thursday) and S109 (Lab, Tuesday), Stafford Campus Scarcella Building.

**Instructor**
Dr. Gholam Pahlavan
Office Hours: Room S115 (Chemistry Department) 11:15 - 12:15 PM Tuesday & Thursday, or by arrangement.
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E-mail: Gholam.pahlavan@hccs.edu
Web site: http://swc2.hccs.edu/natsci/
Or www.Pahlavan.tk

**Textbook**

**Laboratory Manual**

**Optional Study Guide**

**Course Catalog Description**
Science and engineering majors study atomic structure, chemical reactions, thermodynamics, electronic configuration, chemical bonding, molecular structure, gases, states of matter, and properties of solutions. The laboratory includes appropriate experiments. **Prerequisites:** One year of high school chemistry, CHEM 1411, and MATH 1314 (College Algebra). 4 credit (3 lecture, 3 lab).

**Course Prerequisites**
These are stated in the course description in the HCC catalog (quoted just above) and they are stressed again here for emphasis. Lack of satisfactory completion of the course prerequisites are one of the main reasons that cause students to do poorly in chemistry. Basic math and problem solving skills at the level of college algebra are essential. If you are not sure if your prior coursework meets these prerequisites, come and talk to me or to the department chair for advice. With the prerequisites satisfactorily completed (preferably with a grade of B or better), you can be confident that you are well-prepared for this course.

**Course Intent**
This course is intended for students majoring in one of the physical sciences or life sciences, or for students who are pursuing pre-professional programs in medicine, dentistry, pharmacy, veterinary medicine, or other health programs. The course is also beneficial to students who are preparing themselves for higher level science courses in their respective curricula.
Course Content
See the course schedule below for the topics (listed by chapter title) that will be covered in this class. College level general chemistry is very similar to a good high school course, but will usually cover the topics in greater detail and will place a greater emphasis on problem solving.

Attendance Policy
The HCCS attendance policy is stated in the Spring 2004 Schedule of Classes on page 15: “Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Class attendance is checked daily by instructors. Although it is the responsibility of the student to drop a course for non-attendance, the instructor has full authority to drop a student for excessive absences. A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time).” Note that 12.5% is approximately 4 classes or labs for a 4 semester hour course, such as this one, which meets for 3 hours twice weekly. If circumstances significantly prevent you from attending classes, please inform me. I realize that sometimes outside circumstances can interfere with school, and I will try to be as accommodating as possible, but please be aware of the attendance policy.

Last Day for Administrative and Student Withdrawals
For 16 week Spring '04 classes, this date is April 8. I urge any student who is contemplating withdrawing from the class to see me first! You may be doing better than you think. Either way, I want to be accessible and supportive. I do not believe in "weed out" classes, and I consider you to be much more than just a name or number! Note my office hours, above; if you need assistance, I'm here to help.

Disability Support Services (DSS)
If you have any special needs or disabilities which may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance. (At Southwest College, contact Dr. Becky Hauri, 713-718-7909; also see page 27 of the Spring 2004 class schedule for additional DSS numbers.)

Academic Honesty
Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion.

Laboratory Policy
On the first day of lab a safety video will be shown (about 35 min long) and a safety "quiz" will be given and reviewed. Each student will then sign a statement affirming his or her commitment to following safe procedures in the laboratory, and turn the form in to the instructor. You should be especially aware of the need for adequate eye protection in the laboratory. Glasses or goggles must be worn at all times during the laboratory period. Any student not wearing glasses or goggles after the experiment has begun may be given a zero for that experiment! Experiments will be performed in groups of up to three students each. Before you leave the lab, be sure to show me your report so I can review and initial it. Each student should arrive at the lab on time, with his or her lab manual, or a Xerox of the report sheet and the procedure if you are in a financial bind. Laboratory reports are due one week after the experiment. Each report must be done individually, but of course you can work with your lab partners on it. If you are not sure about a calculation or a particular section, ask me about it! You would not believe how often I see absolutely wrong, even ridiculous, answers copied over and over by other students from just one report! Each report will be graded on a 100-point basis. Come to lab prepared. Read through the experiment beforehand, and review the pre-lab questions in the lab manual. You will be much better organized when doing the experiments, and your laboratory experience will be much more rewarding!
Exams and Make-up Policy
Examinations will consist of three non-cumulative regular exams plus a comprehensive final. Make-up exams will not normally be given, so make every effort to take the exams on their scheduled dates. Remember that the final exam will be comprehensive (meaning that it will cover all of the material from the whole semester, not just the last part). Please note: 1) All students are required to take the final (no student can be exempted), and 2) A student who completes the course by taking the final exam cannot receive a "W" in the course. In exceptional cases a W can still be given after the withdrawal date, but if you take the final, then you must receive a regular grade (A-F) in the course.

Assignments
Outside of laboratory reports, special assignments are normally not required. I will periodically give out practice problems but these are not graded. These practice problems, and especially the end of chapter problems, are highly beneficial, indeed essential, to learning chemistry. I recommend that you work as many of the odd numbered end of chapter problems (which have the answers in the back of your textbook) as you can, up to the "Additional Exercises" section. Get a spiral leaf notebook just for working chemistry problems in - that will keep your work more organized and you (or I) can easily review your work.

Grading
The overall score is based on the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Three regular exams</td>
<td>55%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>20%</td>
</tr>
<tr>
<td>Final</td>
<td>25%</td>
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This overall score is calculated as follows:

Overall Score = 0.55(Average of three regular exams) + 0.20(Laboratory grade) + 0.25(Final Exam)

The course grade is then obtained from the overall score:

- 90 - 100 A
- 80 - 89 B
- 70 - 79 C
- 60 - 69 D
- < 60 F

Other Information
Free chemistry tutoring is available. A tutoring schedule will be posted in the classroom and lab and will also be placed on the departmental web site (http://swc2.hccs.edu/natsci/). There are many interesting chemistry resources on the Internet. These are interesting and informative, but spending long hours searching for sites or waiting for graphics intensive sites to load, is not beneficial! Your best immediate source of information is your textbook - make thorough use of it.

General Suggestions
Chemistry is a vast field, ranging from the study of simple inorganic salts to enormously complex molecules such as enzymes and nucleic acids in living organisms. In this course, the major topics we will be covering are chemical formulas, reactions, and stoichiometry calculations, chemical thermodynamics, electron configuration and chemical bonding, gas laws, and solutions. As you might suspect, it can be easy to fall behind and, as a result, to not be ready for the exams. Following are some general tips that may be helpful:

- Learning chemistry takes time. A reasonable guide is to allow yourself two hours of study for each hour of lecture. Heavy work and/or class loads are not compatible with learning chemistry!
- Attend class regularly (!) and take generous notes during class. Ask questions.
When beginning a new chapter, I recommend that you read through it quickly the first time, just to give yourself a good feel for what it is about. If you are really on the job you will have done this before the class lecture on the chapter! You will understand what's going on in class much better if you do this.

Next, start tackling the end of chapter problems! Often, working problems facilitates understanding much better than just reading and rereading the chapter itself. Chemistry is a "hands on" course - working problems is essential. However, do not spend an inordinate amount of time on a single problem - skip it for the time being and go on to another. Try working some of the sample exercises. They are worked out in the chapter and are very helpful.

Get a good, scientific calculator that has scientific notation ("EE" or "EXP" key), log, ln, $x^2$, $\sqrt{x}$, etc. Business calculators usually do not have all of these features.

Review basic math operations such as properties of logarithms, if you are rusty.

Study groups can be very helpful. Keep the group small though, no more than three or four people.

Finally, keep a positive attitude! Chemistry can be hard, but with the right attitude and approach, you will succeed in mastering it!

I hope you find chemistry to be an interesting and rewarding subject which will not only be useful in your academic major, but will give you a better insight into the many scientific challenges we are facing today. I look forward to working with you this semester!

Course Schedule

Chapter 13 – Properties of Solutions
Chapter 14 – Chemical Kinetics
Chapter 15 – Chemical Equilibrium
Chapter 16 – Acid-Base Equilibria
Chapter 17 – Additional Aspects of Aqueous Equilibria
Chapter 19 – Chemical Thermodynamics
Chapter 20 – Electrochemistry
Chapter 21 – Nuclear Chemistry
Chapter 25 – The Chemistry of Life: Organic and Biological Chemistry
Important Dates

Jan. 20 Classes Begin
Feb. 16 President's day Holiday
Mar. 15 - 21 Spring Break
Apr. 8 Last Day to Drop with a grade of "W"
May. 13 Final Exam, Thursday 8 a.m. - (Departmental Comprehensive) (2 hrs.)

Labs Schedule

EXPERIMENT 12 – Colligative Properties: Freezing Point Depression and Molar Mass (handout)
EXPERIMENT 13 – Rates of Chemical Reactions: A Clock Reaction
EXPERIMENT 14 – Acid-Base Properties of Salt Solutions: Hydrolysis
EXPERIMENT 15 – Titration of Acids and Bases
EXPERIMENT 16 – Determination of the dissociation Constant of a weak Acid
EXPERIMENT 17 – Identification of an Unknown Cation; Development of An Analysis Scheme
EXPERIMENT 18 – Electrochemical Cells and Thermodynamics (Optional lab)
EXPERIMENT 19 – Colorimetric Determination of Iron
EXPERIMENT 20 – Molecular Geometry: Experience with Models (Take Home lab)
EXPERIMENT 21 – Preparation of Aspirin and Oil of Wintergreen

Exams Schedule

Feb. 24 EXAM 1 – Chapters 13, 14, and 15
Mar. 30 EXAM 2 – Chapters 16, 17, and 19
Apr. 27 EXAM 3 – Chapters 20, 21, and 25
May 13, Thursday FINAL EXAM - Chapters 13 – 25 (excluding uncovered chapters)