



**HOUSTON COMMUNITY COLLEGE SOUTHWEST**  
**COURSE OUTLINE FOR CHEM 1413-**  
**COLLEGE CHEMISTRY I**  
**Class Number: 82790; Spring 2012, Online Course,**  
**Credit: 4 (3 Lecture, 1 Lab.)**  
**Lecture (<http://hccs1.mrooms3.net>), Lab on Campus**



**Time and location**

Lecture online at (<http://hccs1.mrooms3.net>);

Lab on campus; Saturdays: 9:00 AM- 12:00 PM: Room W164, West Loop Center.

**Instructor**

Dr. Cherif.

Phone: 713-718-7773

**Web site:**

<http://learning.swc.hccs.edu/members/abdallah.cherif>

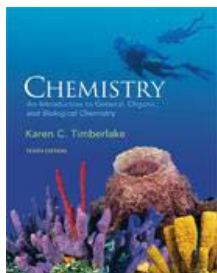
**E-mail:**

All e-mail communications in this class must be made within the Eagle Online e-mail system.

Eagle Online: (<http://hccs1.mrooms3.net>),

DE Main Page: <http://de.hccs.edu>

**Textbook**



**General, Organic, and Biological Chemistry, Structures of Life**, by Karen C. Timberlake.  
Fifth Edition, Pearson Prentice Hall, 2008.

ISBN-10: 0-13-6019706

ISBN-13: 978-0-13-60170-1

Or Custom Edition for HCC:

ISBN-10: 0-558-77499-7

ISBN-13: 978-0-558-77499-8

**Laboratory Manual**

This semester we will be conducting experiments being prepared by Dr. Pahlavan, Dr. Cherif, and Dr. Dessens. Instructions for the laboratory experiments (Introductory Chemistry) are available on the Chemistry Department website.

Online handouts can be accessed and printed from my Learning Web site at:

<http://learning.swc.hccs.edu/members/abdallah.cherif>

***Each student is expected to print a copy of the procedure before performing the laboratory experiment. No copy of the experiment will be provided in class.***

**Optional Resources and Study Guides**

Introductory Chemistry, Concepts and Connections: by Charles H. Corwin. (1305)

General Organic and Biochemistry, by Ira Blei, George Odian ISBN: 0716743752

DE Students may visit the West Loop campus bookstore to purchase books immediately; They may order books online via the HCC bookstore web page at: <http://hccs.bkstore.com>

**Eagle Online Student User ID**

Your Eagle Online login user ID will be your HCC User ID (sometimes referred to as the “W” number). All HCC students have a unique User ID. If you do not know your User ID you can look it up by visiting the HCC Student Help page at <http://www.hccs.edu/hccs/currentstudents/student-system-help>.

Logging into Eagle Online for the first time, the default student password is “distance.” You will then be prompted to change your password after your first login.

Please visit DE Technical Support web site if you need additional assistance.

### **Course Catalog Description**

**Prerequisite: MATH 0312 or MATH 1314 Credit: 4 (3 lecture, 3 lab)**

Nursing and allied health science majors study atomic structure, electron configuration, periodic law, radioactivity and its effects on living organisms, chemical bonding, molecules, gases, solution concentration, acids and bases, and buffers. The laboratory includes appropriate experiments.

**Prerequisites: Must be placed into GUST 0342 (or higher) in reading and ENGL 0310/0349 (or higher) in writing.**  
4 credit (3 lecture, and 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 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.

It is intended to introduce the student to the fundamental principles of chemistry and to acquaint the student with the role chemistry plays in our everyday lives. CHEM 1413 is also intended to serve as a preparatory course for students who are intending to major in a science but have no prior knowledge of chemistry. After taking this course, the student should have a good grasp of atomic structure and the periodic table, naming and writing formulas of ionic and binary molecular compounds, empirical and molecular formulas, chemical bonding, dot structures and molecular geometry, calculations involving unit conversion and stoichiometry, acids and bases, energy changes in reactions, gas laws, interactions between molecules, solutions, and nuclear chemistry. In the laboratory, the student should gain experience in handling lab equipment, measuring length, mass, and volume, separating a mixture, determining empirical formulas, using the activity series, measuring pH, and making observations and drawing conclusions from them.

### **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. Also beneficial to students who are preparing themselves for higher level science courses in their respective curricula.

### **Student Learning Outcomes**

1. Give names and formulas of elements, ions, and ionic and molecular compounds.
2. Categorize, complete, and balance chemical reactions.
3. Classify elements according to their location in the periodic table; identify periodic trends of selected properties of atoms; write the electron configuration of atoms and ions.
4. Do basic chemistry calculations involving reaction stoichiometry.
5. Relate the gas variables using the gas laws and apply Dalton's law of partial pressures to a mixture of gases.
6. Depict chemical bonding with dot structures and predict the molecular shape (geometry) of molecules.

### **Learning Objectives**

- 1.1. Given the name, identify the formula and charge of positive and negative ions, and vice-versa.
- 1.2. Given the name, write the formula of ionic compounds, binary molecular compounds, and acids.

Given the formulas of these types of compounds, name them.

- 2.1. Identify given reactions as combination, decomposition, single displacement, and double displacement.
- 2.2. Starting with the reactants, complete the reaction by writing the reaction products.
- 2.3. Given the reactants and products, balance the reaction.
- 3.1. Based on their location in the periodic table, classify elements by type.
- 3.2. State the periodic law and identify the periodic trend of atomic size, metallic character, and ionization energy.
- 3.3. Write electron dot formulas of representative elements; write the electron configuration of atoms and ions.
- 4.1. Convert amounts in units of mass or volume to moles, and vice-versa.
- 4.2. Given the amount of one substance in a reaction, calculate the amount of the other substances that react or form.
- 4.3. Identify the limiting reactant and excess reactant in a reaction where more than one reactant amount is given.
- 5.1. Relate and calculate the pressure, volume, temperature, or amount of gas using Boyle's law, Charles' law, Gay-Lussac's law, Avogadro's law, the combined gas law, and the ideal gas law.
- 5.2. Use Dalton's law to perform calculations involving gas mixtures.
- 5.3. Explain the assumptions of the kinetic-molecular theory of gases.
- 6.1. Draw the Lewis dot structure of molecules containing two to four atoms.
- 6.2. Based on the dot structure of the molecule, determine its geometry and molecular shape based on VSEPR theory.

**Distance Education (DE) Advising and Counseling Services:** Much DE student information can be found on the DE Student Services website: [de.hccs.edu](http://de.hccs.edu). Advising or counseling can be accomplished through our online request form [AskDECounseling](#). Counselors and Student Services Associates (SSA) can assist students with admissions, registration, entrance testing requirements, degree planning, transfer issues, and career counseling. In-person, confidential sessions can also be scheduled to provide brief counseling and community referrals to address personal concerns affecting academic success.

#### **AskDECounseling FORM**

[AskDECounseling](#) is a student services online help form. This is the best and quickest way for students to get accurate assistance with DE registration, enrollment, advising, and counseling. The online help form is simple to fill out, convenient, and readily accessible through the internet. Students do not have to travel to campus sites, leave work, or wait in an office or lobby to receive assistance. Upon submission, student requests are answered in the order they are received.

#### **Early Alert**

HCC has instituted an Early Alert process by which your professor may “alert” you and DE counselors that you might fail a class because of excessive absences and/or poor academic performance. A counselor will then reach out to you to discuss your progress and offer any relevant resources. This initiative is designed to provide students with support services and resources to assist them in successfully completing their course.

#### **HCC Course Withdrawal Policy**

Beginning Fall 2007, the State of Texas imposes penalties on students who withdraw/drop courses excessively. Students are limited to no more than SIX total course withdrawals throughout their educational career at a Texas public college or university. Students are encouraged to review the [HCC 6 Drop Policy](#). The author said

To help you avoid having to withdraw from any class, contact your DE professor regarding your academic performance. You may also want to contact your DE counselor to learn about helpful HCC resources (e.g. online tutoring, child care, financial aid, job placement, etc.).

### **How To Drop**

- **If a student decides to withdraw from a class upon careful review of other options, the student can withdraw online prior to the deadline through their [HCC Student Center](#).**
- **HCC and/or professors may withdraw students for excessive absences without notification** (see Class Attendance below).
- **Students should check HCC's Academic Calendar by Term for withdrawal dates and deadlines.** Classes of other duration (flex-entry, 8-weeks, etc.) may have different final withdrawal deadlines. Please contact the HCC Registrar's Office at 713.718.8500 to determine mini-term class withdrawal deadlines.

### **Attendance Policy**

The HCCS attendance policy is stated in the Schedule of Classes: "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).*"

The online lecture of the course, attendance is determined by logging into Eagle Online at least once in a weekly basis and doing the online quizzes and exams. Please be aware of the attendance policy.

The on campus laboratory portion of the course is done in-person.

If circumstances significantly prevent you from attending certain lab, please inform me. I realize that sometimes outside circumstances can interfere with school, and I will try to be as accommodating as possible. Make-up labs may be arranged at one of our Southwest HCCS Campuses, but you should make every effort to do the labs on their scheduled days.

### **Last Day for Administrative and Student Withdrawals**

For the **16 week Spring, 12** classes, this date is **March 29<sup>st</sup> (4:30 pm)**. I urge any student who is contemplating withdrawing from the class to see me first! You may be doing better than you think.

If you need assistance, do not hesitate to contact me. I'm here to help.

### **IMPORTANT NOTICE: New Policy Regarding Multiple Repeats of a Course:**

*Students who repeat a course three or more times may face significant tuition/fee increases at HCC and other Texas public colleges and universities. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test-taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.*

### **STUDENT SERVICES:**

#### **DISTANCE EDUCATION ADVISING AND COUNSELING SERVICES:**

Much DE student information can be found on the HCCS DE website at <http://de.hccs.edu>. Advising or counseling can be accomplished through an online request form (quickest and recommended) under "Student Services." Student Services Associates (SSA) and Counselors can assist students with admissions, registration, entrance testing requirements, degree planning, transfer issues, and career counseling. In-person, confidential sessions can also be scheduled to provide brief counseling and community referrals to address personal concerns impacting academic success.

### **INTERNATIONAL STUDENTS:**

International Students are restricted to ONLY ONE online/distance education class per semester. Please contact the International Student Office at 713-718-8520 if you have additional questions about your visa status.

### **STUDENTS WITH DISABILITIES:**

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc) who needs to arrange reasonable accommodations must contact the appropriate HCC [Disability Support Service](#) (DSS) Counselor at the beginning of each semester. Faculty is authorized to provide only the accommodations requested by the Disability Support Services Office.

Students who are requesting special testing accommodations must first contact the appropriate (most convenient) DSS office for assistance.

Disability Support Services Offices: System: 713-718-5165

Central: 713-718-6164 ([Deaf and Hard of Hearing Services](#) and Students Outside of the HCC District service areas)

Northwest: 713-718-5422; Northeast: 713-718-8420; Southeast: 713-718-7218; Southwest: 713-718-7909

After student accommodation letters have been approved by the DSS office and submitted to DE Counseling for processing, students will receive an email confirmation informing them of the Instructional Support Specialist assigned to their professor.

**Orientation is also available at <http://www.hccs.edu/students/disability/faculty.htm>**

### **NOTICE FOR STUDENTS OUTSIDE OF HCC SERVICE AREA:**

Students who live or work outside the HCC service area and cannot take paper exams at one of our HCC testing locations **MUST** make arrangements for a proctor. Please see the DE Student Services Additional Resources webpage (Under “Student Services”) for more information.

### **LIBRARY RESOURCES**

As a DE student you have the same access to first-rate information resources that the HCC Libraries make available to all HCC students. A special website pulls together all the tools DE students will need to complete research. Visit [Library Resources](#) specifically for Distance Education students.

Library services are available throughout HCC. Through a daily library delivery service and a listing of all materials belonging to HCC libraries, books may be requested from and delivered to any campus library. HCC also has cooperative borrowing agreements with the University of Houston libraries and provides a copy of the Houston Public library catalog at each library. These arrangements provide students with access to over 4 million volumes. Special services provided by the library system include photocopying facilities; specialized equipment for disabled students; group and personalized instruction in library use, including a self-instructional media program to orient students to the use of the HCCS libraries; a “term paper” workshop; and online bibliographic search services.

### **ONLINE TUTORING**

HCC provides free online tutoring in writing, math, science, and other subjects. Look for Ask Online on your Blackboard log-in page. This directs students to the HCC [AskOnline](#) Tutoring site: <http://hccs.askonline.net/>. Use your student ID or HCC e-mail address to create an account. Instructions, including a 5-minute video, are provided to make you familiar with the capabilities of this service.

### **SOCIAL NETWORKING**

DE students are encouraged to become a fan of [DE on Facebook](#) and follow [DE on Twitter](#). These social networking sites can provide a sense of community for the online learner, as well as up-to-date information and announcements related to HCC and DE.

### **VIRTUAL CLASSROOM CONDUCT:**

As with on-campus classes, all students in HCC Distance Education courses are required to follow all HCC Policies & Procedures, the Student Code of Conduct, the Student Handbook, and relevant sections of the Texas Education Code when interacting and communicating in a virtual classroom with faculty and fellow students. Students who violate these policies and guidelines will be subject to disciplinary action that could include denial of access to course-related email, discussion groups, and chat rooms or being removed from the class.

### **HCCS Sexual Harassment Policy**

HCC shall provide an educational, employment, and business environment free of sexual harassment. Sexual harassment is a form of sex discrimination that is not tolerated at HCC. Any student who feels that he or she is the victim of sexual harassment has the right to seek redress of the grievance. HCC provides procedures for reviewing and resolving such complaints through its Grievance Policy. Substantiated accusations may result in disciplinary action against the offender, up to and including termination of the employee or suspension of the student. In addition, complainants who make accusations

of sexual harassment in bad faith may be subject to equivalent disciplinary action.

### 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.

### Exams and Make-up Policy

A total of four (4) on campus examinations will be given during the semester, 3 of which are non-cumulative regular exams given during the semester and the fourth is a comprehensive final exam given at the end of the semester. Make-up exams will not normally be given, so make every effort to take the exams on their scheduled dates. In the event that you **must** miss one and only one regular exam, the final exam grade may be substituted for the missed exam. **Remember** that the final exam will be *comprehensive* and is **usually more difficult** than the regular exam (meaning that it will cover *all* of the material from the whole semester, not just the last part). If you do not miss any of the regular exams, I will replace your lowest exam score with your final exam score if the final exam grade is higher.

Please note: 1) All students are required to take the final (no student can be exempted),  
2) After the withdrawal date no W can be given. You **must** receive a regular grade (A-F) in the course.

Also note:

- "Extra Credit Quizzes" will be given for extra points, as well as bonus questions within exams.
- No other type of extra-credit work will be given.
- Online discussion participation will also be graded.
- You will be provided with sample exams on the Learning Web for practice.

### 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 experiment. **Laboratory reports are due on or before the next lab 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 Experiment. You will be much better organized when doing the experiments, and your laboratory experience will be much more rewarding!

### Grading

The **overall score** is based on the following:

<b>Three regular exams</b>	<b>Assessments/ Quizzes</b>	<b>Laboratory</b>	<b>Final Exam</b>
50%	10%	20%	20%

$$\text{Overall Score} = 0.50(\text{Average of 3 regular exams}) + 0.10(\text{Discussions}) + 0.20(\text{Lab. Average}) + 0.20(\text{Final Exam})$$

The **course grade** is then obtained from the overall score:

<b>Final Average</b>	90 - 100	80 - 89	70 - 79	60 - 69	< 60
<b>Letter Grade</b>	A	B	C	D	F

## Other Information

Free chemistry tutoring is available. A tutoring schedule is already posted in the classroom and lab, it is also placed on the departmental web site (<http://learning.swc.hccs.edu/courses/chemistry>).

In addition to “face to face” tutoring, HCC also offers online tutoring from AskOnline. It is also free and is available for chemistry and many other subjects. The login page is at <http://www.hccs.askonline.net>.

There are also many interesting chemistry resources on the Internet which can be found by using keyword searches. But your best immediate source of information is your *textbook* - make thorough use of it!

## Important Dates:

January 16 : Martin Luther King Holiday

**January 17** : Classes Begin

March 12- 18: Spring Break

March 29: Last Day for Administrative/ Student Withdrawals with a grade of “W” (Before 4:30 P.M.); **After the withdrawal date no W can be given, you must receive a regular grade (A-F) in the course.**

May 5: Instruction ends

May 5: Comprehensive Final Exam (at 9:00 a.m.; 2hrs.)

May 21: Grades Available to Students.

## TENTATIVE COURSE SCHEDULE

*Chapter 1 – Measurements*

*Chapter 2 – Energy and Matter*

*Chapter 3 – Atoms and Elements*

*Chapter 4 – Compounds and Their Bonds*

*Chapter 5 – Chemical Quantities and Reactions*

*Chapter 6 – Gasses*

*Chapter 7 – Solutions*

*Chapter 8 – Acids and Bases*

*Chapter 9 – Nuclear Radiation*

## LABS SCHEDULE

**EXPERIMENT 1 – Measurements**

**EXPERIMENT 2 – Properties, separation of mixtures**

**EXPERIMENT 3 – Periodic Table, atoms and elements**

**EXPERIMENT 4 – Emission Spectra, electron arrangement**

**EXPERIMENT 5 – Molecular Geometry, Lewis Dot structures**

**EXPERIMENT 6 – Solubility and Conductivity**

**EXPERIMENT 7 – Empirical Formula of a Hydrate**

**EXPERIMENT 8 – Empirical Formula of a Compound**

**EXPERIMENT 9 – Relative Reactivity of Metals (activity series)**

**EXPERIMENT 10 – Properties and pH of Acids and Bases**

## Tests and Final exam TENTATIVE SCHEDULE

Exams	# 1	# 2	# 3	<b>Final</b>
Chapters	1, 2, 3	4, 5, 6	7, 8, 9	<b>1 through 9</b>
Dates	February 12	March 12	April 16	<b>May 7</b>

Exams	# 1	# 2	#	Final
Chapters	1, 2, 3	4, 5, 6	7, 8, 9	1-9
Dates	February 11	March 10	April 14	May 5

## 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, we will be covering atomic structure, chemical bonding, gram-mole conversions and reaction stoichiometry, gases, intermolecular forces, acids and bases, pH calculations, solutions and concentration, and nuclear chemistry.

A professional chemist may devote his or her entire career to only one of these general disciplines; we have a semester to touch on all of them!

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,  $x^2$ ,  $\sqrt{\quad}$ , etc. Business calculators usually do not have all of these features. I still use a good ol' TI-36 Solar myself.



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!

January, 2012

Dr. Cherif