Time and location
2:00 p.m. – 5:00 p.m.
Tuesdays (Lecture, room W121) and Thursdays (Lab or lecture, room S109), Stafford, Scarcella Science & Technology Bldg.

Instructor
Dr. A. Cherif  
E-mail: abdel.cherif@hccs.edu  
Phone: 832-677-2730  
Learning Web: http://learning.swc.hccs.edu/members/abdallah.cherif  
See also: http://swc2.hccs.edu/pahlavan

Textbook
ISBN-10: 0495112585,  
ISBN-10: 0495116289,  
ISBN-13: 9780495116288 (Softcover Ed.) |

Laboratory Manual
The laboratory experiments (CHEM 2425) are available on my Learning Web site http://learning.swc.hccs.edu/members/abdallah.cherif, or Dr. Pahlavan's Website: http://swc2.hccs.edu/pahlavan.  
Print out the materials for each lab assignment from the web links and bring them to class on the appropriate day.  
No copy of the experiment will be provided in class.

Optional Study Guide and Solutions Manual

Course Description
This is a continuation of CHEM 2423. Topics include benzene and EAS reactions, alcohols and ethers, aldehydes, ketones, carboxylic acids and their derivatives, condensation reactions, amines, phenols, and infrared and NMR spectroscopy. The laboratory program includes appropriate experiments. Prerequisite: CHEM 2423. 4 credit (3 lecture, 3 lab).  
The study of carbon compounds, including an introduction to organic reaction mechanisms. Topics include alkanes, alkenes, alkynes, stereochemistry, alkyl halides and substitution reactions, and organic synthesis. Prerequisite: CHEM 1412 or CHEM 1414. 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. 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, you can be confident that you are well-prepared for this course.

Course Intent
This course is a continuation of CHEM 2423 and is intended for the student majoring in the physical or life sciences or who is pursuing a pre-professional plan in medicine, dentistry, pharmacy, veterinary medicine, or a related health field. Various graduate programs in the medical and health professions also require 4 to 8 semester hours of sophomore or junior level organic chemistry.

Course Content
See the class schedule below for the topics (listed by chapter title) that will be covered in this class.

Last Day for Administrative and Student Withdrawals
This date is stated in the Schedule of Classes. After the withdrawal date no W can be given, you must receive a regular grade (A-F) in the course. 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! If you need assistance, do not hesitate to contact me (my phone number and e-mail address are listed above). I'm here to help.

**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).”

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.

**IMPORTANT NOTICE:**
Students who repeat a course three or more times may soon 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.

**Disability Support Services (DSS)**
HCC is committed to compliance with the American with Disabilities Act and the Rehabilitation Act of 1973 (section 504) "Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty are authorized to provide only the accommodations requested by the Disability Support Services Office.”

If you have any special needs or disabilities which may affect your ability to succeed in college classes or participate in college programs/activities, please contact the office of disability support services at the college. Upon consultation and documentation, you will be provided with reasonable accommodations and/or modifications. Please contact the DSS office as soon as you begin the term. For questions, contact Donna Price at 713 718 5165 or the Disability Counselor at HCC-Southwest: Dr. Becky A. Hauri at 713 718 7909; also see the Schedule of Classes for additional DSS numbers.

Also visit the ADA web site at: [http://www.hccs.edu/students/disability/index.htm](http://www.hccs.edu/students/disability/index.htm)
Faculty Handbook/Faculty Orientation is also available at [http://www.hccs.edu/students/disability/faculty.htm](http://www.hccs.edu/students/disability/faculty.htm)

**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.

**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.

**Laboratory Policy**
Laboratory rules and safety instructions will be reviewed by the instructor. You should be especially aware of the need for adequate **Eye Protection** and **Protective Clothing** in the laboratory.

**Safety glasses or goggles and Lab Coat are mandatory. They must be worn at all times during the laboratory period.**

Coats can be obtained at most uniform and medical supplies stores.

Any student not wearing **goggles** or **Lab coat** after the experiment has begun may be given a zero for that experiment! **Laboratory reports are due one week after the experiment. See the accompanying handout which outlines the format of the lab report.** Each report will be graded on a 20 point basis. You should come to lab prepared. Read through the experiment beforehand, and answer the pre-lab questions in the lab manual. Each student should keep a bound laboratory notebook (clothbound is standard; spiral is acceptable). This is for you to record your "on the spot" observations, changes to procedure, etc., and general data. The actual reports are done separately, and individually; not one report for the whole group. Makeup policy for missed labs: None!
Exams, Quizzes, and Make-up Policy

Examinations will consist of three non-cumulative regular exams (45%) plus a comprehensive final (20%). Make-up exams will not normally be given, so make every effort to take the exams on their scheduled dates. 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, and calculate the final course grade accordingly. In the event that you must miss one and only one regular exam, the final exam 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 3 or 4 chapters). This is intended to provide you a "second chance" if you do not do well on a particular exam.

During the semester I will periodically give a short chapter quiz at the beginning of class. I will drop the lowest quiz grade. The remainder will count as a regular exam grade (15%) which cannot be dropped. These quizzes are highly beneficial for learning the material and are intended to help you in this regard.

Please note: 1) All students are required to take the final (no student can be exempted), and 2) A grade of W cannot be given after the withdrawal date; student 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.

A useful collection of chapter by chapter notes are posted on my LW site: http://learning.swc.hccs.edu/members/abdullah.cherif. Also a nice collection of chapter by chapter problems and practice exams is on Dr. Pahlavan’s web site (http://swc2.hccs.edu/pahlavan). Working practice problems, and the problems in the textbook, is highly beneficial, indeed essential, to learning organic chemistry. I recommend using a spiral leaf notebook just for working chemistry problems - this 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>Three Regular Exams</th>
<th>Quiz Grade</th>
<th>Laboratory</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>45%</td>
<td>15%</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Overall Score = 0.45(Average of three regular exams) + 0.15(Quiz Grade) + 0.20(Laboratory grade) + 0.25(Final Exam)

The course grade is then obtained from the overall score:

<table>
<thead>
<tr>
<th>Final Average</th>
<th>90 – 100</th>
<th>80 - 89</th>
<th>70 – 79</th>
<th>60 – 69</th>
<th>&lt; 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter Grade</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

Other Information

Free chemistry tutoring is available. A tutoring schedule will be posted in the classroom and lab and will also be placed on our departmental web site (http://learning.swc.hccs.edu/courses/chemistry).

HCC also offers online tutoring. It is free and is available for chemistry and many other subjects. The login page is at http://www.hccs.askonline.net.

There are many interesting and informative chemistry resources on the Internet, 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.

Important dates

January 18: Classes Begin
February 21: Presidents Day Holiday
March 14-20: Spring Break
April 21: Last Day for Administrative/ Student Withdrawals with a grade of “W”

“Remember: After the withdrawal date no W can be given, you must receive a regular grade (A-F) in the course.”

April 22-24: Easter Holiday
May 8: Instruction ends
May 12: Department Comprehensive Final Exam (Thursday at 2:00 p.m.; 2 hrs.)
May 20: Grades Available to Students.
A Few Comments...

Mastering organic chemistry takes time! In my experience, the number one hindrance to doing well is lack of adequate and quality time to study outside of the classroom. Of course, you must also have a reasonable grasp of the principles you learned in General Chemistry. Remember the old adage, "For every hour of classroom time you should allow for two hours of study time at home," for it is true. A heavy class and/or work load does not leave much quality study time! By "quality" time I mean periods in which you can study undisturbed, when you are still wide-awake and alert. Pace yourself - overloading yourself trying to meet an application deadline is a recipe for disaster! Always feel free to ask me anything about the material, no matter how trivial the question may seem. Trying (!) to answer those "simple" questions often leads to a much greater understanding (or to at least a greater appreciation!) of the subject.

Organic chemistry is a vast field. Practically all of the substances we take for granted around us (and in us!), are composed of compounds of carbon. We begin our exploration and understanding of this very large subject in this class. I look forward to working with you this semester!

January 10, 2011.

Format of Laboratory Report

Your laboratory report should be divided into the following sections. Be sure to label each section!

I. Introduction
   A brief statement of the purpose of the experiment; A good place to show relevant structures and chemical equations.

II. Experimental Procedure
   A brief outline of the experimental procedure. Be particular about reporting the amounts of materials used and any modifications made to the original procedure (avoid simply copying the original procedure).

III. Results and Discussion
   This section is the most important. Include observations such as appearance of the reaction, color of product, etc. If the experiment was a preparative one, you should also report your percent yield:

   \[
   \text{Percent Yield} = \frac{\text{Actual or experimental yield in grams (or moles)}}{\text{Theoretical or calculated yield in grams (or moles)}} \times 100
   \]

   Show all of your calculations! Graphs should be done on graph paper.
   Note: Our lab manual contains a "Data Report Sheet" for each experiment. You may record your results here and include this sheet at this stage of your report. The discussion part comes from you! Were your results what you expected? If, not, can you suggest reasons why not? If you took a melting point of a compound you synthesized, what is the true, or "literature" melting point? How well does your melting point compare? What does your melting point indicate about the purity of your compound? Assume that your reader is not entirely familiar with the experiment, so you need to explain clearly.

IV. Conclusions
   Your overall evaluation of your results. This is a good place to mention any modifications to the procedure which you feel might improve the outcome of the experiment.

V. Answers to Exercises
   These questions appear at the end of each experiment in the laboratory manual. Usually you will be given selected "prelaboratory" questions and "regular" questions from the lab manual to answer.

Your should write your report in ink, or type it, using one side of the paper only. If you write your report by hand (which is perfectly OK as long as it is neat and legible), use lined paper (not torn out of a spiral notebook!). Always use complete sentences. Try your best to avoid spelling and grammatical errors. Write your report in impersonal form. The words "I" or "we" should not appear in your report. The following examples show some incorrect phrases and how they can be revised to avoid the personal form:

<table>
<thead>
<tr>
<th>☹ INCORRECT:</th>
<th>☝ CORRECT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>I added 10 g of NaCl to ...</td>
<td>Ten grams of NaCl were added to ...</td>
</tr>
<tr>
<td>You told me that ...</td>
<td>The instructor indicated that ...</td>
</tr>
<tr>
<td>We determined that ...</td>
<td>It was determined that ...</td>
</tr>
</tbody>
</table>

Etc. This style of writing may seem awkward sometimes, but this is the proper form for writing reports. You will find that this writing style is used extensively in articles and research papers in the scientific literature.
Course Schedule

Chapter 12  Structure Determination: Mass Spectrometry and Infrared Spectroscopy
Chapter 13  Structure Determination: Nuclear Magnetic Resonance Spectroscopy
Chapter 14  Conjugated Compounds and Ultraviolet Spectroscopy
Chapter 15  Benzene and Aromaticity
Chapter 16  Chemistry of Benzene: Electrophilic Aromatic Substitution (EAS)
Chapter 17  Alcohols and Phenols
Chapter 18  Ethers, Epoxides; Thiols and Sulfides
Chapter 19  Aldehydes and Ketones: Nucleophilic Addition Reactions (NAR)
Chapter 20  Carboxylic Acids and Nitriles
Chapter 21  Carboxylic Acids Derivatives: Nucleophilic Acyl substitution reactions
Chapter 22  Carbonyl Alpha- Substitution Reactions
Chapter 23  Carbonyl Condensation Reactions
Chapter 24  Amines

Optional Chapters:
Chapter 24  Carbohydrates
Chapter 26  Aryl Amines and Phenols
Chapter 27  Amino Acids, Peptides, and Proteins

Laboratory Schedule

EXPERIMENT 1 – Infra – Red (IR) and Nuclear Magnetic Resonance (NMR): Exercises in Molecular Spectroscopy- Structural Determination.
EXPERIMENT 2 – The Diels-Alder Reaction: Preparation of Endo-Norbornene-5,6-cis-Dicarboxylic Anhydride
EXPERIMENT 3 – Nitration of Aromatic Compounds: Preparation of Methyl m-Nitrobenzoate
EXPERIMENT 4 – Properties of Alcohols: Structure, Reactions and Identification of Alcohols
EXPERIMENT 5 – Dehydration of Alcohols: Dehydration od Cyclohexanol
EXPERIMENT 6 – Identification of Aldehydes and Ketones
EXPERIMENT 7 – Aldol Condensation: Synthesis of Dibenzalacetone
EXPERIMENT 8 – Carboxylic Acid Reactions and Derivatives
EXPERIMENT 9 – Synthesis of Aspirin - Esterification
EXPERIMENT10 – Properties of Amines

EXPERIMENT11 – Equilibrium Constants for Esterification (Optional)
EXPERIMENT12 – The Friedel –Crafts Reactions ( Optional)
EXPERIMENT13 – The Grignard Reaction (Optional)

Exams Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Exam</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 22*</td>
<td>EXAM 1</td>
<td>12-15</td>
</tr>
<tr>
<td>March 29*</td>
<td>EXAM 2</td>
<td>16-19</td>
</tr>
<tr>
<td>May 3*</td>
<td>EXAM 3</td>
<td>20-23</td>
</tr>
<tr>
<td>May 12</td>
<td>FINAL EXAM</td>
<td>12 – 24</td>
</tr>
</tbody>
</table>

(*) Date may change
Note that the dates of starting and finishing individual chapters are not indicated, as some material will be covered on exam and lab days as well.