



Division of Natural Sciences and Horticulture

Department of Chemistry

<http://learning.hccs.edu/programs/chemistry>

CHEM 2423: Organic Chemistry I | Lecture | CRN 73071

Summer 2018 | 5 Weeks (6.4.2018 - 7.8.2018)

In-Person | Southwest | M-Fri 12p.m-3.50 p.m.

6-hour lecture/lab course | 96 hours per semester

Instructor Contact Information

Instructor: Dr. Gomathi Ramanoudjame
HCC Email: Gomathi.ramanoudjame@hccs.edu

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics. I will respond to emails within 24 hours Monday through Friday; I will reply to weekend messages on Monday mornings.

What's Exciting about This Course

Organic chemistry is at the heart of chemistry and medicine. This course is an introduction to the fundamental chemistry of carbon-containing compounds, including three-dimensional structures, chemical properties, and methods of structural identification, reactions, and syntheses. The course explores some of the major classes of organic compounds: alkanes, alkenes, alkynes, alkyl halides, alcohols, and ethers, with an emphasis on reaction mechanisms and multi-step syntheses. Designed for students in science or pre-professional programs. Chem 2423 is a Core Curriculum Course.

My Personal Welcome

Welcome to Orgo 1— I'm delighted that you have chosen this course. One of my passions is the elucidation of organic chemistry concepts. I can hardly wait to pass that on to you. I will present the information in the most exciting way I know, so that you can grasp the concepts and apply them now and hopefully throughout your life. As you read and wrestle with new ideas and facts that may challenge you, I am available to support you. The fastest way to reach me is by my HCC email. The best way to really discuss issues is in person and I'm available during posted office hours to tackle any questions you might have. My goal is for you to walk out of the course with a better understanding of organic chemistry. So please visit me or contact me whenever you have a question.

Prerequisites and/or Co-Requisites

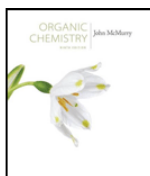
Prerequisites: CHEM 1412; must be placed into college-level reading and be placed into MATH 1314 (or higher) and be placed into college-level writing. Please carefully read and consider the repeater policy in the [HCCS Student Handbook](#).

HCC LEARNING WEB

This section of CHEM 2423 will have powerpoint lectures and powerpoint images posted on the HCC learning web. It is recommended that you **USE [FIREFOX](#) OR [CHROME](#) AS YOUR BROWSER**.

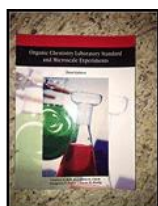
Instructional Materials

Textbook Information



The materials listed below are **required** for this course.

1. McMurray (2016). *Organic Chemistry* 9th ed., Cengage Learning, MA. ISBN 9781305080485



2. LAB MANUAL: Bell (2009). *Organic Chemistry Laboratory Standard and Microscale Experiments*. 3rd ed., Cengage Learning Custom Publication, MA. ISBN: 9781424075478

The texts are included in a package that contains the text as well as an access code and are found at the [HCC Bookstore](#). You may either use a hard copy of the book, or rent the e-book from Pearson. Order your book here: [HCC Bookstore](#)

3. A Lab coat

Tutoring

HCC provides free, confidential, and convenient academic support to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for details.

Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the

libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

Course Overview for CHEM 2423

CHEM 2423 is the first part of organic chemistry course which is intended to show students the importance of organic chemistry in their major area of study as well as its applications to their daily lives. It provides the necessary background for specialist studies and includes appropriate experiments to reinforce theoretical concepts.

Core Curriculum Objectives (CCOs) for all CHEM Core Courses

CHEM 2423 satisfies the chemistry requirement in the HCCS core curriculum. The HCCS Chemistry Discipline Committee has specified that the course addresses the following core objectives:

1. Demonstrate basic mastery of chemistry by writing formula and equations for chemical reactions, performing chemical calculations and recognizing the application of chemistry in our daily lives
2. Demonstrate a mastery of introductory and intermediate level chemistry to promote success in higher level chemistry and other science programs in four year universities
3. Demonstrate a mastery of General and Organic Chemistry in preparation for allied and professional health programs and engineering
4. Conduct laboratory experiments by making measurements, performing chemical reactions and analyzing the results in a group or individual setting.

Program Student Learning Outcomes (PSLOs) for all CHEM Courses

Can be found at <http://learning.hccs.edu/programs/chemistry>

Course Student Learning Outcomes (CSLOs) for CHEM 2423

1. Compare and contrast the structures, properties, and reactions of aliphatic hydrocarbons (alkanes, alkenes, and alkynes), and alkyl halides.

2. Formulate reaction mechanisms for the synthesis and transformation of the above functional groups.
3. Perform and justify the separation techniques used in purifying organic compounds.
4. Interpret experimental data obtained from classical and spectroscopic methods used in characterizing organic compounds

Learning Objectives for CHEM 2423

Learning Objectives for each CSLO can be found at Learning Objectives for CHEM 2423. Specifically, they are:

SLO 1. Compare and contrast the structures, properties, and reactions of aliphatic hydrocarbons, alkyl halides, alcohols, and ethers.

1.1. Explain the stereochemistry and chirality of organic compounds using specific rotation, optical activity, enantiomers, and diastereomers.

1.2. Identify the nomenclature rules for alkyl halides using IUPAC rules (method) to determine how to prepare alkyl halides.

1.3. Determine the structure of atoms, orbitals, hybridization, and electron configurations.

1.4. Identify the polarity of compounds such as acids, bases, and salts and draw Lewis dot resonance structures.

1.5. Identify functional groups and compare the conformations and stereochemistry of alkanes and cycloalkane derivatives.

SLO 2. Formulate reaction mechanisms for the synthesis and transformation of the above functional groups.

2.1. Write and identify the organic reaction mechanisms using electron flow (curved arrows) and determine the energy of organic reactions.

2.2. Explain the mechanisms of electrophilic reactions by orientation of Markovnikov's rule and Cahn-Ingold-Prelog priority sequence rule for E and Z designation.

2.3. Prepare (synthesis) and complete reactions of alkenes and cycloalkenes such as addition, elimination, and oxidative cleavage.

2.4. Prepare (synthesis) and complete reactions of alkynes such as addition, elimination, and oxidative cleavage.

2.5. Describe the reaction mechanism types for alkyl halides such as E1, E2, SN1, and SN2 using the stability of carbocation and basicity of nucleophiles.

SLO 3. Perform and justify the separation techniques used in purifying organic compounds.

3.1. Purify organic solids by recrystallization and verify purity by melting point, IR spectroscopy, and thin layer chromatography.

3.2. Separate a mixture of liquids by simple and fractional distillation and compare the effectiveness of the two methods.

3.3. Perform single and multiple extractions of a solid dissolved in aqueous solution, calculate K_d for the organic solvent used, and compare the effectiveness of each method.

3.4. Purify a liquid product by distillation and verify purity by boiling point and IR spectroscopy.

SLO 4. Interpret experimental data obtained from classical and spectroscopic methods used in characterizing organic compounds.

4.1. At campuses with GC-MS instrumentation, identify the structure of organic compounds using mass spectral fragmentation patterns based on molecular weight and degree of unsaturation. In absence of instrumentation, analyze mass spectral data from textbook and other sources.

Student Success in CHEM 2423

As with any six-hour course, expect to spend ***at least six hours per week*** outside of class reading and studying the material. I will provide assignments to help you use those six hours per week wisely. Additional time will be required for written assignments. Successful completion of this course requires a combination of reading the textbook, attending class, completing selected assignments, and participating in class discussions. There is no short cut for success in this course; it requires reading, solving problems and studying the material using the course objectives as your guide.

Instructor and Student Responsibilities

As your Instructor, it is my responsibility to:

- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through class activities, discussions, and lectures
- Provide a description of any special projects or assignments
- Inform students of policies such as attendance, withdrawal, tardiness and make up
- Provide the course outline and class calendar which will include a description of any special projects or assignments
- Arrange to meet with individual students before and after class as required

To be successful in this class, it is the student's responsibility to:

- Attend class and participate in class discussions and activities
- Read and comprehend the textbook
- Complete the required assignments and exams:
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts, and all assignments
- Attain a raw score of at least 70% on the departmental final exam
- Be aware of and comply with academic honesty policies in the [HCCS Student Handbook](#)

Academic Integrity

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 may include a grade of "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 Assignments

Exams

Examinations will consist of four non-cumulative regular exams plus a comprehensive final. Make-up exams will not normally be given. A grade received due to scholastic dishonesty can't be dropped. Please note that all students are required to take the final. Time allowed for all exams is two hours. Scantron is required for all exams. No bathroom breaks during an exam. HCC does not provide students with Scantron forms. They are sold in campus bookstores.

Written Assignment

End of Chapter Homework Problems

Test 1

Chapter 1: 1:23; 1:26; 1:38; 1:42; 1:56

Chapter 2: 2:26; 2:32; 2:36; 2:37; 2:43; 2:55; 2:56; 2:58

Chapter 3: 3:22; 3:29; 3:35; 3:38; 3:40

Test 2

Chapter 4: 4:30; 4:35; 4:37; 4:38;

Chapter 6: 6:16; 6:17; 6:18; 6:20; 6:22; 6:23; 6:29; 6:35; 6:41 Chapter 7:

7:26; 7:27; 7:34; 7:37; 7:45; 7:46; 7:48; 7:54

Test 3

Chapter 5: 5:37; 5:41; 5:43; 5:56

Chapter 8: 8:30(a); 8:42; 8:43; 8:44; 8:50; 8:53

Chapter 10: 10:22; 10:23; 10:25; 10:26; 10:32; 10:32; 10:49

Test 4

Chapter 9: 9:20(a); 9:21(a); 9:26; 9:26; 9:31; 9:37; 9:40

Chapter 11: 11:30; 11:41; 11:55; 11:56

Chapter 12: 12:14; 12:17; 12:24

In-Class Activities

Students should be ready to take a quiz on the reading assignment due for that day.

CHEM 2423 Departmental Final Exam

All students will be required to take a comprehensive departmental final exam consisting of 35 multiple-choice and 6 short answer questions. Students must provide their own Scantron forms (FORM NUMBER 886-E). All the information students need to prepare for the exam is in the review given in class or the [*Final Exam Handbook*](#).

Students who are absent from the final exam without discussing their absence with the instructor in advance or within 24 hours afterward will receive a final exam grade of zero.

Any student who does not take a makeup final exam by the end of the following long semester will receive a final exam grade of zero and a course grade of F.

Policy Regarding Making Up Missed Exams

"No makeups" for exams since instructor will drop the lowest exam between Exams 1,2, and 4. **Exam 3 cannot be dropped.**

Grading Formula

The overall score is based on the following:

- Three regular exams (**Must include Test 3**) = 60%
- Laboratory = 20%
- Final Exam = 20%

Course Grade = $0.60(\text{Average of three regular exams}) + 0.20(\text{Laboratory grade}) + 0.20(\text{Final Exam})$

Quizzes and/or homework will be part of the grade of a non-cumulative exam.

Grade	%
A	100-90
B	89-80
C	79-70
D	69-60
F	<59

HCC Grading Scale can be found on this site under HCC Grading System:
<http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/>

Course Calendar

Week #	Lecture	Lab
Week 1 6/4	Course Introduction Chapter 1: Structure and Bonding Chapter 2: Polar Covalent Bonds & Chapter 3: Organic Compounds- Alkanes and Their Stereochemistry Test Review	6/5 Introduction – Lab Safety Lab Safety Quiz from Experiment 1:
Week 2 6/11	Test 1: Chapters 1-3.5 Chapter 4: Cycloalkanes Chapter 6: An overview of organic reactions Chapter 7: Alkenes: Structure and Reactivity Test Review	6/12 Experiment 2: Melting Point Determination: Procedures a, b, c
Week 3 6/18	Test 2: Chapters 4, 6 & 7 Chapter 8: Alkenes: Reactions and Synthesis Chapter 5: Stereochemistry at Tetrahedral Centers Chapter 10: Organohalides	6/19 Exp. 3: Recrystallization – Procedure C & Selection of Research Paper Topic. 6/21 Exp. 4: Extraction – Procedure A
Week 4 6/25	Test 3: Chapters 5, 8 & 10 Chapter 9: Alkynes: Introduction to Organic Synthesis Chapter 11: Reactions of Alkyl Halides- SN2, SN1, E2, E1, Chapter 12: Structure Determination Mass Spectrometry and Infrared	6/26 Exp. 5: Distillation 6/26 Exp. 10: Dehydration of Alcohols 6/28 Exp. 12: Properties of Hydrocarbons
Week 5 7/2 7/3 7/4 7/5	Test 4: Chapters 9, 11 & 12 Review for Final Exam Holiday – Independence Day Final Exam	7/3 Review for Final Comprehensive Exam

Syllabus Modifications

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes.

Other Course Information

HCC Online Information and Policies

<http://www.hccs.edu/online/>

EGLS³

The EGLS³ ([Evaluation for Greater Learning Student Survey System](#)) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term. EGLS³ surveys are only available for the Fall and Spring semesters. -EGLS3 surveys are not offered during the Summer semester due to logistical constraints.

<https://hccsaweb.hccs.edu:8080/psp/csprd/?cmd=login&languageCd=ENG&>

HCC Email Policy

HCC prefers students to communicate only through the HCCS email system to protect your privacy. If you have not activated your HCCS student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

HCC Policy Statements

Here's the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> . In it you will find information about the following:

- Academic Honesty
- Academic Information
- Academic Support
- Attendance, Repeating Courses, and Withdrawal
- Campus Carry
- Career Planning and Job Search
- Childcare
- Course Etiquette
- disAbility Support Services
- Electronic Devices
- Equal Educational Opportunity
- Financial Aid TV (FATV)
- General Student Complaints
- Grade of FX and International Students
- Health Awareness
- Incomplete Grades
- International Student Services
- Libraries/Bookstore
- Police Services & Campus Safety
- Student Life at HCC
- Student Rights and Responsibilities
- Student Services
- Testing
- Transfer Planning
- Veteran Services

Basic Needs

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so. Additional information may be found at: <http://www.hccs.edu/applying-and-paying/financial-aid/financial-coach/>

Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

Disability Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
(713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu
<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

Chemistry Department Chair

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