El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Chemistry**
COURSE RUBRIC AND NUMBER	**CHEM 2423**
COURSE TITLE	**Organic Chemistry I**
COURSE CREDIT HOURS	**4 3 : 3** **Credits Lec. Lab**

I. Catalog Description

Studies the fundamental principles of organic chemistry including the structure, bonding, properties, and reactivity of organic molecules; and properties and behavior of organic compounds and their derivatives. Emphasizes the organic synthesis and mechanisms. Studies the covalent and ionic bonding, nomenclature, stereochemistry, structure and reactivity, reaction mechanisms, functional groups, and synthesis of simple molecules. Provides the use of spectroscopic data to determine the structure of organic molecules. THIS COURSE IS INTENDED FOR STUDENTS IN SCIENCE OR PRE-PROFESSIONAL PROGRAMS.
Prerequisites: CHEM 1311 and CHEM 1111 and CHEM 1312 and CHEM 1112. (3:3). Lab fee.

II. Course Objectives

Upon satisfactory completion of this course, the student will be able to:

A. Understand the Atomic Structure, Orbitals, and Electron Configuration. Explain the development of Chemical Bonding Theory Visualizing Organic Chemistry. Explain Covalent Bonds. Interpret the Valence Bond Theory and Molecular Orbital Theory.
Understand Hybridization sp^3, sp^2, and sp.

B. Identify the polar bonds and their consequences. Understand the difference between Polar Covalent Bonds and Electronegativity. Solve Problems related with Dipole Moment, and Formal Charges Understand and apply the rules for Resonance Forms. Draw different resonance forms. Explain the difference between Acids and Bases: The Brownsted-Lowry Definition; Acids and Base Strength; Predict Acid-Base Reactions from pK_a Values. Explain the difference between organic acids and organic bases; Acids and Bases. Understand the Lewis Definition.

C. Understand and identify Organic Compounds such as Alkanes and Cycloalkanes: Recognize the functional groups, alkyl groups, isomers, and nomenclature. Understand the stereochemistry of alkanes and cycloalkanes, as well as the different conformations of ethane, propane and butane. Predict the stability and conformation of cycloalkanes.

D. Solve problems involving different organic reactions. Be able to understand and interpret the reaction mechanisms, radical reactions, polar reactions, and how they occur. Be able to predict a reaction, involving equilibria, rates, bond dissociation energies, and energy changes.

E. Understand and identify Organic Compounds such as Alkenes, their structure and reactivity. Recognize the industrial preparation and use of alkenes. Solve problems about their molecule's degree of unsaturation. Apply the rules for nomenclature, electronic structure and cis-trans isomerism of alkenes. Understand how is the electrophilic addition using Markonikov's Rule. Predict the carbocation formation and stability. Solve problems involving reaction mechanisms of Electrophilic Addition and carbon rearrangements. Identify the reactions and synthesis of alkenes such as addition of halogens to alkenes, halohydrin formation, addition of water to alkenes, oxymercuration and

hydroboration. Understand the reduction of alkenes, such as hydrogenation. Oxidation: hydroxylation and cleavage.

F. Understand and identify Alkynes, their electronic structure and reactivity. Solve problems about their molecule's degree of unsaturation. Apply the rules for nomenclature. Understand the preparation of alkynes, including elimination reactions of dihalides. Predict their addition reactions of HX and X_2. Understand the reactions of hydration, reduction, and oxidative cleavage. Predict the acidity of alkynes and formation of anions.

G. Be able to interpret stereochemistry of enantiomers and the tetrahedral carbon, the reason for Handedness in molecules, chirality, optical activity, specific rotation, sequence rules for specification of configuration, diastereomers, mesocompounds, molecules with more than two chirality centers, racemic mixtures and their resolution, and fisher projections.

III. THECB Learning Outcomes (ACGM)

Upon successful completion of this course, students will:

1. Classify organic compounds by structure, molecular orbitals, hybridization, resonance, tautomerism, polarity, chirality, conformation, and functionality.
2. Identify organic molecules using appropriate organic nomenclature.
3. Describe the principle reactions for syntheses of molecules, ions, and radicals.
4. Describe organic reactions in terms of radical and ionic mechanisms.
5. Describe the use of spectroscopic data to determine the structure of organic molecules.
6. Formulate appropriate reaction conditions for the synthesis of simple organic molecules.

Learning Outcomes (Lab)

1. Perform chemical experiments, analysis procedures, and waste disposal in a safe and responsible manner.
2. Utilize scientific tools such as glassware and analytical instruments to collect and analyze data.
3. Identify and utilize appropriate separation techniques such as distillation, extraction, and chromatography to purify organic compounds.
4. Record experimental work completely and accurately in laboratory notebooks, and communicate experimental results clearly in written reports.
5. Demonstrate a basic understanding of stereochemistry.
6. Classify organic compounds by structure, molecular orbitals, hybridization, resonance, tautomerism, polarity, chirality, conformation, and functionality in laboratory reports.
7. Identify organic molecules using appropriate organic nomenclature in laboratory reports.
8. Perform organic syntheses of molecules.
9. Describe organic reactions in terms of radical and ionic mechanisms in laboratory reports.
10. Use spectroscopic data to determine the structure of organic molecules.
11. Formulate appropriate reaction conditions for the synthesis of simple organic molecules.

IV. Evaluation

A. Pre-assessment

Instructors should check each student's prerequisites the first week of class; those who do not qualify should be sent back to Admissions.

B. Challenge Exam

Students who wish to challenge the course should contact the Testing Center and the Division Dean. Challenges must be accomplished before the census cut-off date. Students who previously have received a W or a letter grade for the course are not eligible to challenge the course.

C. Post-assessment

1. The instructor will maintain a continuous record of each student's progress on an institutionally approved grade sheet or computerized substitute. All instructors must keep records in such a way that information would be clear to a second party having to check grade computation in special cases. An explanatory legend should be provided on the grade sheet.

2. The evaluation of the exams should be in an objective and reproducible manner. In addition to reading assignments, the instructor may require quizzes and exercises on the subject material.

It is essential that students commit themselves to the assignments throughout the semester.

Number and Types of Examinations: The course will include a minimum of four major written examinations and one final examination.

Reading assignments of textbook or library materials may vary in length, depending on the nature of the subject, and may be part of the examinations.

The following approaches may be involved; however, instructors should stress the possible overlap of these strategies.

1. Process analysis
2. Critical thinking
3. Comparison/contrast
4. Classification
5. Definition
6. Description
7. Causal analysis
8. Analogy
9. Problem/solution

D. Final Examination
A final examination is required in all Chemistry 2423 classes. The exam should consist of all material covered in class during the semester in the scheduled two-hour final examination period. The final essay should reflect a satisfactory mastery of the course objectives including the use of appropriate strategies of problem solving.

E. Grading Percentages
Grade percentages for determining the course grade may be devised by the individual instructor, but the grade for the final exam should be averaged as 200% of the regular exam grades.

F. Remediation
There will be no remediation. Since the lowest exam grade is dropped, there are no make-up examinations.

G. Grading Scale:

A = 90 - 100	F = below 60
B = 80 - 89	I = Incomplete
C = 70 - 79	W = Withdrew or withdrawn
D = 60 - 69	

V. Disability Statement (American with/Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024)

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.