UNIVERSITY OF PUERTO RICO AT ARECIBO
PHYSICS/CHEMISTRY DEPARTMENT
BACHELOR OF TECHNOLOGY IN INDUSTRIAL CHEMICAL PROCESSES

Course N°: QUIM 3450

Credits: 5

Contact Hours: 4/weekly

Pre- requisite: TEQU 3003 / QUIM 3002

Co-requisite: QUIM 3451

Title of Course: Organic Chemistry Fundamentals

Open to: Industrial Chemical Processes Technology and Chemical Engineering Transfer students

Textbook: Essential Organic Chemistry

Author: Paula Y. Bruice

Publisher: Pearson Prentice Hall

Publication Year: 2010

Other Supplemental Materials:

- Study Guide & Solutions; Manual for Essential Organic Chemistry, Paula Y. Bruice, Pearson Prentice Hall, 2010
- Organic Chemistry, 7thEdition L. G. Wade, Jr., Prentice Hall, 2010

Term: Second Semester

Course Coordinator: Dr. Ricardo Infante

Course Description:
Study of the fundamental principles of organic chemistry. It emphasizes properties, reactions, synthesis, and reaction mechanisms of organic compounds.

Course Objectives:

- Recognize the fundamental principles of organic chemistry.
- Identify structural features of alkanes, cycloalkanes, alkenes, alkynes, alkyl halides, alcohols, ethers, aromatic compounds, aldehydes, ketones, acids and acid derivatives.
- Identify nomenclature, preparation and reactions of the main organic functional groups.
- Predict and rationalize potential reaction pathways for major and minor products in organic reactions using kinetics and thermodynamics aspects.
- Predict the regiochemistry and stereochemistry of the following organic reaction mechanisms using curved arrow notation.
- Use NMR, IR, MS, and UV-Vis spectroscopy to determine the structure of organic compounds.

Relation of Course to Program Objectives:

1	2	3	4
x			

Relation of Course to Program Outcomes:

1	2	3	4	5	6	7	8	9	10	11
x	x	x								

Evaluation/Grade Reporting: four partial exams and final exam (75%), laboratory work (25%).

Topics	Teaching/Learning Strategies Time Distribution (hours)
Introduction to organic chemistry Rules of the I.U.P.A.C nomenclature system to name alkanes and cycloalkanes.	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Unsaturated hydrocarbons: alkenes, alkynes and aromatics Equations predicting the products of addition and substitution reactions of alkenes/alkynes and aromatics hydrocarbons respectively	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Stereoisomerism	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Alkyl halides, amines, alcohols, phenols, thiols and ethers Names and structures. Equations representing the preparation, reactions and synthesis. Classification of alcohols as primary, secondary or tertiary. Identification the reactions of alkyl halkides as SN1, SN2, E1 and E2.	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Carboxylic acids and carboxylic acid derivatives Names and structures. Equations representing the preparation, reactions and synthesis.	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Aldehydes and ketones Names and structures. Equations representing the preparation, reactions and synthesis.	Problem solving and seminar type discussions. Additional methods of instruction will include: presentations or demonstrations, use of media and technology, and team /collaborative activities. (10)
Total	60