GROSSMONT COLLEGE

Official Course Outline

CHEMISTRY 242 – ORGANIC CHEMISTRY II LECTURE

1. Course Number Course Title Semester Units Semester Hours

CHEM 242 Organic Chemistry II 3 3 hours lecture: 48-54 hours

Lecture 96-108 outside-of-class hours

144-162 total hours

2. Course Prerequisites

A “C” grade or higher or “Pass” in Chemistry 231 or Chemistry 241 or equivalent

Corequisite

A “C” grade or higher or “Pass” in Chemistry 241L or equivalent or concurrent enrollment in Chemistry 241L.

Recommended Preparation

None

3. Catalog Description

Second of a two semester sequence. The topics covered will include: structure and reactivity of carboxylic acids and their derivatives, amines and other nitrogen functional groups, aromatic compounds, heterocyclic compounds, polyfunctional compounds, conjugation and aromaticity, and multistep organic synthesis**.**

4. Course Objectives

The student will:

1. Predict products and mechanisms of oxidation-reduction reactions in organic chemistry.
2. Predict the products and mechanisms of organic reactions involving organometallic compounds.
3. Distinguish among the numerous types of conjugated unsaturated systems and their use in organic synthesis.
4. Determine whether an organic compound is aromatic and understand electrophilic aromatic substitution reactions.
5. Predict the mechanisms and products of nucleophilic addition and nucleophilic addition-elimination reactions involving carbonyl substrates.
6. Distinguish among the various mechanisms and reactions involving enols and enolates.
7. Distinguish among the various types of reactions and mechanisms involving amines.
8. Distinguish between nucleophilic substitution reactions involving phenols or aryl halides.
9. Design the synthesis and identify intermediates for an organic compound requiring multiple reaction steps.

5. Instructional Facilities

1. Lecture room with demonstration bench equipped with gas, air, vacuum, water, sink.
2. Computer room with computers loaded with molecular modeling and drawing software.
3. Smart Cart.
4. Wall mounted Periodic Chart.

6. Special Materials Required of Student

1. Scientific calculator with exponential and logarithmic functionality.
2. Molecular model kit.

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7. Course Content

1. Organometallic chemistry
2. Conjugated unsaturated systems
3. Aromatic compounds and their reactivity
4. Nucleophilic addition to carbonyl groups
5. Carboxylic acids and their derivatives
6. Nucleophilic aromatic substitution
7. Multistep organic transformations
8. Electrophilic aromatic substitution.
9. Reactions of enolate anions and enols.
10. Di, conjugated and polyfunctional carbonyl compounds.
11. Heterocyclic and nitrogen (amine) chemistry.
12. Carbon skeleton rearrangement reactions including Claisen, Beckmann, Hoffmann rearrangement reactions and pericyclic rearrangements.

8. Method of Instruction

1. Lectures.
2. Videos and appropriate media.
3. Computer assisted instruction.

9. Methods of Evaluating Student Performance

1. Written exams and final exam.
2. Essays/presentations on topics such as experimental results, descriptive chemistry or current issues in chemistry.
3. Capstone project involving a proposal for a total synthesis of a natural product. Students will show all synthetic steps from commercially available starting materials, and address reaction conditions and stereochemistry in each step.
4. Homework both text and computer drills.

10. Outside Class Assignments

1. Essays/presentations on topics such as descriptive chemistry or current issues in chemistry.
2. Homework, both text and computer based.
3. Capstone project involving a proposal for a total synthesis of a natural product. Students will show all synthetic steps from commercially available starting materials, and address reaction conditions and stereochemistry in each step.

11. Texts

1. Required Text(s):

Wade, L.G. *Organic Chemistry*. 9th ed. Upper Saddle River, New Jersey: Pearson, 2016.

1. Supplementary texts and workbooks:

None.

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

* 1. Demonstrate a working knowledge of the language of organic chemistry.
  2. Recognize the major functional groups of organic compounds.
  3. Predict the major products of chemical reactions of representative organic functional groups.
  4. Apply a theoretical approach to explain the chemical and physical behavior of organic compounds.

Date approved by the Governing Board: December 13, 2016