MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. CHEM____ COURSE NUMBER: 2202____

NUMBER OF CREDITS: 5 Lecture: 3 Lab: 2

Course Title:
Organic Chemistry II

Catalog Description:
Organic Chemistry II continues CHEM 2201 with emphasis on multistep organic synthesis, orbital interactions, structure determination, and reaction classes including addition, nucleophilic addition-elimination, aromatic substitution, pericyclic reactions, free radical reactions, and polymerization. This course is for students majoring in science, pre-engineering, or pre-health (medicine, pharmacy, veterinary medicine). This course includes a lab.
Prerequisite: CHEM 2201.

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Goal 1: Communication: ____ by meeting the following competencies:
Goal 2: Critical Thinking: ____ by meeting the following competencies:
Goal 3: Natural Sciences: X by meeting the following competencies:
  • Demonstrate understanding of scientific theories.
  • Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
  • Communicate their experimental findings, analyses, and interpretations both orally and in writing.
  • Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 4: Mathematics/Logical Reasoning: ____ by meeting the following competencies:
Goal 5: History and the Social and Behavioral Sciences: ____ by meeting the following competencies:
Goal 6: The Humanities and Fine Arts: ____ by meeting the following competencies:
Goal 7: Human Diversity: ____ by meeting the following competencies:
Goal 8: Global Perspective: ____ by meeting the following competencies:
Goal 9: Ethical and Civic Responsibility: ____ by meeting the following competencies:
Goal 10: People and the Environment: ____ by meeting the following competencies:

**Prerequisites or Necessary Entry Skills/Knowledge:**
CHEM 2201

**Topics to be Covered (General)**
- Organic synthesis
- Extended pi-systems, conjugation, and aromaticity
- Structural determination using ultraviolet (UV) spectroscopy, infrared (IR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, and mass spectrometry (MS).
- Nucleophilic addition reactions
- Oxidation-reduction reactions
- Carbon-carbon bond-forming reactions
- Nucleophilic addition-elimination reactions
- Aromatic substitution reactions
- Pericyclic reactions
- Free-radical reactions
- Polymerization reactions

**Student Learning Outcomes**
- Predict properties of organic molecules using concepts of molecular structure, formal charge, and resonance.
- Translate between compound names and representations of structure.
- Identify functional groups within complex molecules.
- Determine the isomeric relationships between compounds using three-dimensional structures.
- Predict the products of organic reactions through the application of thermodynamic and kinetic principles.
- Propose reaction mechanisms using the curved-arrow formalism.
- Create logical synthetic strategies by combining reactions into multi-step sequences.
- Plan organic reactions in the laboratory using stoichiometry calculations.
- Perform successful hands-on organic reactions in the laboratory to maximize product yield and purity.
- Determine the identity and purity of laboratory products using physical and spectroscopic methods.

**Is this course part of a transfer pathway:** Yes [ ] No [X]

Revised 02/21