A. Course Description

Credits: 3

Prerequisites: CHEM 231 Organic Chemistry I AND CHEM 332 Organic Chemistry II

Lab Hours/ Weeks: Corequisites: CHEM 435 - Advanced Organic Chemistry Lab

Lecture Hours/ Week :

MnTC Goals: None

This upper-division elective course is designed for chemistry majors and minors who have completed Organic Chemistry 1 and 2. Students will develop their abilities to construct multistep syntheses for complex molecules, including asymmetric catalysis, and refine their understanding of reaction mechanisms. Students will expand their knowledge of transformations on molecules with biological, pharmaceutical, and industrial significance. Students will read current primary literature for organic chemistry and gain understanding of research methodologies.

B. Course Effective Dates: 05/05/2015 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Understand the contributions of steric and electronics to the physical properties and chemical reactivities of a molecule.
2. Understand how molecular orbital theory assists the chemical bonding model for organic compounds.
3. Be able to write reasonable reaction mechanisms substitution, elimination, enolate, radical, and pericyclic reactions.
4. Understand principles of retrosynthesis and be able to formulate multistep syntheses of complex molecules.
5. Understand the importance of absolute and relative molecular stereochemistry in a molecule's function and formulate synthetic strategies to ensure the desired stereochemistry is produced, including methods of asymmetric catalysis.
6. Understand protecting group strategies in multistep synthesis.
7. Identify reaction optimization strategies.
8. Be familiar with the modern techniques of molecular analysis, including 2-D NMR experiments.
9. Identify peer-reviewed journals for organic chemistry research; be able to read, comprehend, and summarize articles of primary literature for organic chemistry.

E. Learning Outcomes (MN Transfer Curriculum)

This contains no goal areas.

G. Special Information

Corequisites: This lecture is designed to be taken concurrently with CHEM 435, Advanced Organic Chemistry Lab. Note: First day attendance required except by instructor permission.