**Department of Chemistry Syllabus**

This syllabi is advisory only. For details on a particular instructor's syllabus (including books), consult the instructor's course page. For a list of what courses are being taught each quarter, refer to the Courses page. *Every instructor has prerogative to teach the course as they see fit and ultimately the instructor's syllabus supersedes all others.*

***CHE 8A: Organic Chemistry: Brief Course***

Approved:

Suggested Textbook: (actual textbook varies by instructor; check your instructor)

Essential Organic Chemistry, 3nd Edition”, P. Y. Bruice

Mastering Chemistry Software for 3rd Ed. Essential Organic Chemistry

Essential Organic Chemistry Study Guide and Solution Manual, 3rd Ed.

Organic Chemistry as a Second Language 3rd Ed. David Klein

“Molecular Models for visualization and laboratory.

Suggested Schedule:

Week 1 Chap. 1 Intro, Assessment

Chap. 1 Bonds and Structure

Week 2 Chap. 1 Drawing Organic Structures

Chap. 1 Hybridization

Quiz 1 – Chap 1

Week 3 Chap. 2 Acids and Bases - Types

Chap. 2 Acids and Bases – Structure and pKa

Week 4 Chap. 3 Basics of Organic Compounds – Functional Groups

Quiz 2 – Chap 2

Chap. 3 Basics of Organic Compounds - Nomenclature

Week 5 Chap. 3 Basics of Organic Compounds – Properties

Chap. 3 Basics of Organic Compounds - Rotamers

Quiz 3 – Chap 3

Week 6 Chap. 4 Rings and Strain

Chap. 5 Stereoisomers

Week 7 Chap. 5 Optical Activity and Multiple Stereocenters

Quiz 4 – Chap 4, 5

Chap. 6 Alkenes

Week 8 Chap. 6 Mechanisms and Reactions of Alkenes

Chap. 6 Carbocations and Reactions

Quiz 5 – Chap 5, 6

Week 9 Chap. 7 Resonance and Delocalized Systems

Chap. 7/8 Reactions of Dienes

Substitution of Haloalkanes

Week 10 Chap. 8 Elimination Reactions

Quiz 6 – Chap 7, 8

Week 11 FINAL EXAM

Additional Notes:

Prerequisites: CHE-2B or CHE-2BH with a C or better.

Learning Goals:

Upon successful completion of this course students should be able to:

Draw organic molecules using condensed formula, Kekule structures, zig-zag, or bond-line structures.

Identify common organic functional groups and their general properties.

Identify Bronsted-Lowry acids and bases and understand the principles behind acid strength and predict the pKa’s of common organic functional groups.

Identify Lewis acids and bases, nucleophiles and electrophiles, and oxidizing and reducing agents.

Name linear, cyclic, and branched alkanes, haloalkanes, , alkenes and alkynes using IUPAC nomenclature and recognize the common names of everyday molecules.

Explain the strain and stability of carbocations and cycloalkanes.

Understand the three dimensional structure of organic molecules and identify achiral molecules, enantiomers, diastereomers, and meso molecules. Be able to identify chiral centers and label their configurations.

Understand and explain the reactions of alkenes and alkynes including determining the products of reaction, reagents used in reactions and mechanisms.

Describe and explain the properties of various points along a reaction coordinate

Describe how resonance pertains to organic molecules and be able to draw resonance structures. Interpret relative stability of delocalized substances

Explain the mechanisms of SN2. SN1, E1 and E2 reactions of haloalkanes and predict which mechanism will occur under given conditions using principles of substrate reactivity, nucleophilicity, and leaving group stability.

Integrate reactions of alkanes, haloalkanes, alkenes and alkynes into multistep synthesis of target compounds from given starting materials.