**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 118B: Organic Chemistry for Health and Life Sciences***

Approved:

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

“Organic Chemistry, 7th Edition”, K.P.C. Vollhardt & N.Schore

“Study Guide/ Solution Manual, 7th Ed.”

“Chemistry 118B Laboratory”

Suggested Schedule:

Week 1

Monday Chap. 11 Intro, 11.1

Wednesday Chap. 11 11.2-11.4

Friday Chap. 11 11.4, 11.6

Week 2

Monday Chap. 11 11.9-11.11

Wednesday Chap. 12 12.1-12.4

Friday Chap. 12 12.5-12.9

Week 3

Monday Chap. 12 12.9-12.12

Wednesday Chap. 12 12.12-12.16

Friday Chap. 13 13.1-13.3

Week 4

Monday Chap. 13 13.4-13.6

Wednesday MIDTERM 1

Friday Chap. 13 13.7-13.9

Week 5

Monday Chap. 13 13.10-13.11,

Wednesday Chap. 14 14.1-14.3

Friday Chap. 14 14.4-14.8

Week 6

Monday Chap. 14 14.8-10

Wednesday Chap. 15 15.1-2, 15.4

Friday Chap. 15 15.5-15.8

Week 7

Monday Chap. 15 15.13, 16.1

Wednesday Chap. 16 16.2-5

Friday MIDTERM 2

Week 8

Monday Chap. 16 16.5, 16.7

Wednesday Chap. 17 17.1-17.4

Friday Chap. 17 17.5-17.8

Week 9

Monday Chap. 17 17.9-17.14

Wednesday Chap. 18 18.1-18.5

Friday Chap. 18 18.6-18.8

Chap. 18 18.9-18.10

Week 10 Finals

Laboratory Schedule

Week 1 Check-in. Introduction to the laboratory.

Lab A – Spectroscopy Review, 13C NMR, and MS

Week 2 Lab B - Boiling Point Determination

Lab C - Synthesis of 2-Chloro-2-methylbutane (*tert*-Pentyl Chloride)

Week 3 Lab D: Identification of a Mixed Unknown

Lab E: Melting Point Determination

Week 4 Lab F: Oxidation of Isoborneol

Week 5 Lab G: Dehydration of 2-methylcyclohexanol

Lab H: Diels-Alder Reactions

Week 6 Lab H: Diels-Alder Reactions

Formal Report 1 (Lab D) is due.

Week 7 Lab I: Nitration of Methyl Benzoate

Week 8 Lab J: Identification of an Unknown (aldehydes and ketones)

Week 9 Lab J: Identification of an Unknown (aldehydes and ketones) (mp only)

Lab K: Aldol Condensation

Check out.

Formal Report 2 (Lab J) is due.

Additional Notes:

Prerequisite: course 118A or 128A

Learning Goals:

Upon completion of this course students should be able to:

Name compounds containing alkenes, alkynes, substituted benzenes, aldehydes, and ketones using the IUPAC system and recognize the common names of everyday molecules.

Understand and explain the reactions of alkenes and alkynes including product determination, reagents used in reactions, and mechanisms such as hydroboration and electrophilic addition to and alkene.

Understand and explain the consequences of conjugation in alkenes including electrocyclic reactions, UV absorption, resonance stabilization, and thermodynamic vs. kinetic stability in reactions.

Understand and explain the reactions of benzene and substituted benzenes including ortho, meta, para selectivity and activating and deactivating functional groups, product determination, and the mechanism of electrophilic aromatic substitution.

Understand and explain the reactions of aldehydes and ketones including product determination, reagents used in reactions and mechanisms such as nucleophilic addition of a strong nucleophile to a carbonyl and acetal formation.

Understand and explain the reactions adjacent to a carbonyl including product determination, reagents, and mechanisms such as aldol formation and enolate formation.

Understand and explain the principles of 13C NMR spectroscopy expand upon the understanding of the IR and 1H NMR spectroscopy of alkenes, alkynes, benzenes, aldehydes, and ketones including geminal, vicinal, and allylic coupling in the 1H NMR of alkenes to allow for identification of unknown compounds from their spectra.

Integrate reactions of alkenes, alkynes, benzene, aldehydes and ketones with reactions from 118A into multistep synthesis of target molecules.