UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY
COURSE SYLLABUS
WINTER 2017

1. Course: CHEMISTRY 357, Industrial Organic Chemistry for Engineers

L01: MWF, 11:00-11:50am, EDC 179.
Instructor and Course Co-ordinator: Dr. A.S. Causton, Office: SA144A, Tel. No.: 403-210-3968,
e-mail: acauston@ucalgary.ca, Office Hours: TBA.
Desire 2 Learn (D2L) Site: CHEM 357 L01 - (Winter 2016) - Industrial Organic Chemistry for Engineers

L02: MWF, 13:00-13:50am, ICT 102.
Instructor: Dr. A.S. Musgrove Richer, Office: SA EEEL237C, Tel. No.: 403-220-7602,
e-mail: amanda.musgroveriche@ucalgary.ca, Office Hours: TBA.
Desire 2 Learn (D2L) Site: CHEM 357 L02 - (Winter 2016) - Industrial Organic Chemistry for Engineers
Departmental Office: Room SA 229, Tel: 403-220-5341, e-mail: uginfo@chem.ucalgary.ca

2. Course Description: The hybridization of the carbon atom and covalent bonding. Typical reactions of alkanes, alkenes, alkynes and industrial applications. Substitution; halogenation, nitration and oxidation of aromatic hydrocarbons; polymerization and industrial applications. Functional groups and their reactions; oxidation, reduction, addition and elimination reactions, industrial applications.

3. Recommended/ Required Textbook(s): None

4. Outcome Goals of CHEM 357 *Industrial Organic Chemistry for Engineers*:

- to develop an understanding of fundamental concepts of organic chemistry
- understand how the properties of an organic material are linked to its structure

Basic Organic Nomenclature and Terminology

Chemical Bonding

Isomerism

Physical Properties (intermolecular forces and conformational analysis)

Kinetics, Thermodynamics & Equilibrium

Curly Arrows & Reaction Mechanisms including:

- Radical reactions
- Acid base chemistry
- Addition reactions
- Substitution reactions
- Elimination reactions
- Aromatic substitution reactions

Polymers

- Types of synthetic polymers
- Selected reactions of:
  - Alcohols, phenols & thiols
  - Ethers & epoxides
  - Carbonyl containing compounds
  - Amines & other nitrogen containing compounds

Department Approval: Approved by Department Head Date: December 20, 2016