**CAMOSUN COLLEGE**

***COURSE OUTLINE***

# CHEM 112

# Introduction to Organic Chemistry

**This course, in combination with Chem 110, constitutes a first year university transfer package for students not planning to take advanced chemistry courses at the second year level. Topics include hydrocarbons; alkyl halides; alcohols; ethers; thiols; amines; aldehydes; ketones; carboxylic acids; esters and amides; carbohydrates; lipids; amino acids and proteins; nucleic acids;**
**(4 credits)**
**F, W, P (4,2,0,0,)**
**Prerequisite: Chem 110 or Chem 12**

## Teacher

(a) Howard J. Duncan

(b) Office hours: See Timetable on Office Door

(c) Office Location: F308B

(d) Phone: 250-370-3445

(e) E-mail: duncanh@camosun.bc.ca

## Required Materials

(1)Textbook (Shrink wrapped chapters from Fundamentals of General, Organic and Biological Chemistry: McMurry & Castellion, 4th edition, Prentice Hall)
(2) Chem 112 Lab Manual
(3) Safety Glasses

## Course Content

INTRODUCTION TO ORGANIC CHEMISTRY: Functional Groups, Hydrocarbons, Alkanes, Nomenclature, Properties and Reactions, Structural Isomers, Cycloalkanes, Alkyl Halides.

ALKENES, ALKYNES AND AROMATIC COMPOUNDS: Structures, Isomers and Nomenclature of Alkenes, Physical Properties and Reactions, Aromatic Hydrocarbons.

ORGANIC COMPOUNDS CONTAINING OXYGEN, SULFUR OR HALOGENS: Alcohols, Phenols, Nomenclature, Properties and Reactions, Ethers, Thiols and Disulfides.

AMINES: Structures and Nomenclature, Basicity of Amines, Heterocyclic Compounds, Purines and Pyrimidines.

ALDEHYDES AND KETONES: Carbonyl Groups, Nomenclature, Physical Properties and Reactions, Oxidation and Reduction Reactions,

CARBOXYLIC ACIDS, ESTERS AND AMIDES: Carboxylic Acids, Properties and Nomenclature, Acidity of Carboxylic Acids, Synthesis of Esters and Amides, Hydrolysis Reactions, Phosphoric Acid Derivatives.

CARBOHYDRATES: Carbohydrate Isomers and Nomenclature, Monosaccharides - Glucose, Fructose and Ribose, Hemiacetals and Acetals, Disaccharides – Maltose, Lactose and Sucrose, Polysaccharides – Starch (Amylose and Amylopectin), Glycogen, Cellulose, Mucopolysaccharides.

LIPIDS: Fatty Acids (Saturated and Unsaturated – Cis/Trans Isomerism), Properties and Nomenclature, Essential Fatty Acids, Triacylglycerols, Hydrogenation and Trans-unsaturated Fatty Acids, Phospholipids and Membrane Fluidity, Essential Fatty Acids and Eicosanoids, Cholesterol, Steroid Hormones, Bile Salts.

AMINO ACIDS AND PROTEINS: Structures and Properties of Amino Acids, Peptide Bonds, Primary Structure, Secondary, Tertiary and Quaternary Protein Structures, Characteristics and Functions of Proteins, Hemoglobin.

NUCLEIC ACIDS: Purines and Pyrimidines, Nucleotides, Ribonucleic Acid (RNA), Deoxyribonucleic Acid (DNA), Structure and Composition of Nucleic Acids, Base-Pairing and the Genetic Code, Introduction to Replication, Transcription and Translation.

## Student Assessment

(a) Lab Reports (10%)
(b) Quizzes (15% and 25%)
(c) Final Exam (50%)

## Grading System

The following percentage conversion to letter grade will be used:

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|---|---|---|
| A+ = 95 - 100% | B = 75 - 79% | D = 50 - 59% |
| A = 90 - 94% | B- = 70 - 74% | F = 0.0 - 49% |
| A- = 85 - 89% | C+ = 65 - 69% | |
| B+ = 80 - 84% | C = 60 - 64% | |