

**FACULTY OF SCIENCE  
DEPARTMENT OF CHEMISTRY  
COURSE INFORMATION – WINTER 2016**

**Course: CHEMISTRY 553 – BIOORGANIC CHEMISTRY**

**Course Coordinator:** Dr. Chang-Chun Ling                      SB 235                      tel: 403-220-2768                      [ccling@ucalgary.ca](mailto:ccling@ucalgary.ca)

**Lectures / Instructors:**

LEC	DAYS	TIME	ROOM	INSTRUCTOR	OFFICE	PHONE	EMAIL	OFFICE HOURS
L01	TR	12:30-13:45	SA 247	Dr. C.-C. Ling	SB 235	220-2768	<a href="mailto:ccling@ucalgary.ca">ccling@ucalgary.ca</a>	TBA

**TEXTBOOK / RECOMMENDED MATERIALS FOR THE COURSE:**

There is no text required for the course. Any standard "Organic Chemistry" text that has chapters on amino acids, peptides, proteins, carbohydrates, and nucleic acids may prove useful. Handouts and other relevant references will be provided throughout the course.

**TOPICS COVERED (Subject to Changes):**

**Foundation to Bioorganic Chemistry:**

- Brief reviews of some organic concepts
- Tools for molecular visualization
- Molecular interactions (including Host-Guest Chemistry), polyvalency
- Introduction to simple bioorganic molecules
- Prebiotic chemistry

**Amino Acids, Peptides and Proteins:**

- Amino acids, structure and properties
- Amino acid synthesis
- Amide bond and formation
- Proteins, primary, secondary, tertiary, and quaternary structure
- Protein structure and function:
  - Enzymes and enzyme mechanisms

**Carbohydrate Chemistry:**

- Monosaccharides and their reactions
- Conformation and stereo-electronic effects
- Glycosidic linkages
- Reactions at the anomeric center
- Stereocontrol in Glycosylations
- Chemoenzymatic synthesis of glycoconjugates
- Application of synthetic carbohydrate chemistry to real life problems

**Nucleic Acid Chemistry:**

- Pyrimidine and Purine and Base pairs
- Structures of DNA/RNA
- Synthesis of nucleotides
- Interactions of DNA/RNA with small organic molecules

Introduction to Drug Discovery Processes

Group Projects