

Course discipline/number/title: CHEM 2800: Biochemistry

A. CATALOG DESCRIPTION

1. Credits: 3
2. Hours/Week: 3
3. Prerequisites (Course discipline/number): CHEM 2100 or CHEM 2127
4. Other requirements: None
5. MnTC Goals (if any): NA

B. COURSE DESCRIPTION: This course introduces the fundamental principles in biochemistry. Topics cover the structure and function of biomolecules, kinetics of enzyme-catalyzed reactions, major metabolic pathways that synthesize and degrade biomolecules, and the storage and transmission of genetic information in organisms.

C. DATE LAST REVISED (Month, year): February, 2021

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Chemical Principles
 - a) Acids/bases/buffers
 - b) Equilibrium
 - c) Chemical bonding
 - d) Thermodynamics
 - e) Organic chemistry
 - f) Kinetics
2. Structure and Function of Biomolecules
 - a) Carbohydrates
 - b) Lipids
 - c) Nucleic Acids
 - d) Proteins
3. Metabolism
 - a) Glycolysis
 - b) Citric and cycle
 - c) Electron transport and oxidative phosphorylation
 - d) Gluconeogenesis and glycogen metabolism
 - e) Pentose Phosphate Pathway
 - f) Photosynthesis
 - g) Lipids
 - h) Nucleotides
 - i) Amino Acids
 - j) Metabolic Regulation
4. Gene Expression and Regulation
 - a) Replication
 - b) Transcription
 - c) Translation
 - d) Gene Regulation
 - e) Biotechnology

E. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Use basic biochemistry vocabulary.
2. Solve problems related to the principles in biochemistry.
3. Describe biochemical interactions on the molecular scale.
4. Perceive how biochemistry plays a central role in medicine, health sciences, environmental sciences and industrial biotechnology.

- F. LEARNING OUTCOMES (MNTC): NA
- G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:
1. Assigned homework activities
 2. Quizzes based on concepts covered in lecture
 3. Problem solving exams
- G. RCTC CORE OUTCOME(S): This course contributes to meeting the following RCTC Core Outcome(s): Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.
- H. SPECIAL INFORMATION (if any): None