ROCHESTER COMMUNITY AND TECHNICAL COLLEGE

COMMON COURSE OUTLINE

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