COMMON COURSE OUTLINE: Course discipline/number/title: CHEM 1119: Biochemistry

A. CATALOG DESCRIPTION
1. Credits: 3
2. Hours/Week: 3
3. Prerequisites (Course discipline/number): CHEM 2100 or CHEM 1117 and one of the following: BIOL 1110, BIOL 1217, or BIOL 1220.
4. Co-requisites (Course discipline/number): None
5. MnTC Goals (if any): NA

This course is intended for students that need an introductory biochemistry course without a laboratory component. The structure and reactivity of carbohydrates, lipids, proteins and nucleic acids will be described, and then the cellular metabolism of these compounds will be covered. Also discussed will be digestion, acid-base balance, and fluid and electrolyte regulation. RECOMMENDED ENTRY SKILLS/KNOWLEDGE: College level reading and writing skills and working knowledge of algebra.

B. DATE LAST REVISED (Month, year): November, 2002

C. OUTLINE OF MAJOR CONTENT AREAS:
1. Inorganic Chemistry Review
   a) Periodic table
   b) Chemical bonding
   c) Equilibrium
   d) Acids and bases
   e) Buffering

2. Carbon Chemistry Review
   a) Alcohols
   b) Ethers
   c) Aldehydes and ketones
   d) Organic acids and esters
   e) Amines and amides

3. Carbohydrates
   a) Monosaccharides
   b) Disaccharides
   c) Polysaccharides

4. Lipids
   a) Triglycerides
   b) Phospholipids
   c) Steroids
   d) Waxes
   e) Lipid composition of cell membranes
   f) Prostaglandins

5. Proteins
   a) Amino acids
   b) Peptide binding
   c) Chain conformation
   d) Buffering
   e) Hemoglobin

6. Enzymes
   a) Specificity
   b) Cofactors
C. OUTLINE OF MAJOR CONTENT AREAS: Continued. . .
   c) Control of activity
   d) Medical uses

7. Nucleic Acids
   a) Structure
   b) Replication
   c) Transcription
   d) Translation
   e) Regulation
   f) Molecular diseases

8. Recombinant DNA
   a) Methods
   b) Uses
   c) Possible gene therapy

9. Homeostasis
   a) Digestion
   b) Blood buffering
   c) Transport of respiratory gases
   d) Renal control of fluids and electrolytes
   e) Acid-base regulation

10. Metabolic Interactions
    a) Carbohydrate catabolism, anabolism
    b) Lipid catabolism, anabolism
    c) Diabetes mellitus
    d) Protein catabolism
    e) Interconversions

D. LEARNING OUTCOMES (GENERAL): The student will be able to:
   1. To understand basic chemistry concepts and laws.
   2. To use basic chemical principles and laws to help predict how any given variable may influence a given chemical or physical change.
   3. To understand that basic chemical principles underlie reactions occurring in living organisms.
   4. To become familiar with current applications of genetic research and gene cloning.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. Problem-solving quizzes and homework
   2. Lecture exams involving chemical principles covered in lecture

G. SPECIAL INFORMATION (if any): None