Course Objectives/Course Outline
Spokane Community College

Course Title:	**Intro to Biochemistry: w/Lab**
Prefix and Course Number:	**CHEM& 123**

Course Learning Outcomes:
By the end of this course, a student should be able to:

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Course Outline:

I. Proteins
   A. Structure of Amino Acids
   B. Physical and Chemical Properties of Amino Acids
   C. Ionic Charge and pH
   D. Primary, Secondary, Tertiary and Quaternary Structure in Proteins
   E. Physical and Chemical Properties of Proteins
   F. Chemical Reactions of Amino Acids and Proteins

II. Enzymes
   A. Chemical Nature of Enzymes and Their Function in Biochemical Reactions
   B. Enzyme Activity
   C. Regulation of Enzymes (Temperature, pH, Concentration, Inhibitors, Activators, Covalent Modification, and Genetic Control)
   D. Vitamins

III. Chemical Messengers
   A. Chemical Nature of Hormones and Neurotransmitters
   B. Hormones and Neurotransmitters and Cell Communication
   C. Endocrine System
   D. Drugs

IV. Metabolism
   A. Strategies of Metabolism
   B. Cell Structure
   C. ATP Coupled Reactions
   D. Coenzymes and Reduced Coenzymes

V. Carbohydrates
   A. Structure of Monosaccharides
   B. Physical and Chemical Properties of Monosaccharides
   C. Physical and Chemical Properties of Disaccharides and Polysaccharides
   D. Chemical Reactions of Monosaccharides, Disaccharides and Polysaccharides

VI. Carbohydrate Metabolism
   A. Carbohydrate Digestion
   B. Glycolysis
   C. Entry of Other Carbohydrates into Glycolysis
   D. Chemical Reactions of Pyruvate

E. Citric Acid Cycle, Glycogenesis, Glycogenolysis, and Gluconeogenesis Pathways
F. Regulation of Pathways
G. Electron-Transport Chain and ATP Production
H. Blockers and Uncouplers of Oxidative Phosphorylation
I. Role of Pathways and Energy Production

VII. Lipids
A. Structure and Classification of Lipids
B. Physical and Chemical Properties of Lipids
C. Chemical Reactions of Lipids
D. Cell Membrane Lipids
E. Structure of Cell Membrane
F. Transport Across Cell Membrane

VIII. Lipid Metabolism
A. Triglyceride Digestion
B. Lipid Transport
C. Lipid Storage
D. Beta Oxidation
E. Lipogenesis
F. Ketogenesis
G. Regulation of Pathways
H. Role of Pathways and Energy Production

IX. Protein Metabolism
A. Protein Digestion
B. Protein Catabolism
C. Amino Acid Catabolism
D. Urea Cycle
E. Regulation of Pathways
F. Role of Pathways and Energy Production

X. Nucleic Acids and Protein Synthesis
A. Structure of Nucleic Acids, DNA, and RNA
B. DNA Replication
C. Transcription
D. Translation
E. RNA

XI. Body Fluids
A. Major Categories of Body Fluids
B. Body Fluid Composition
C. Red Blood Cells and Blood Gases
D. Alkalosis
E. Acidosis

XII. Laboratories
A. Perform laboratory experiments pertaining to the above chemical concepts, record observations, gather and analyze data, and present the results in written form