I. Course Title
Biochemistry I

II. Course Prefix/Number
CHEM 401

III. Credit Hours
3

IV. Prerequisites
CHEM 322, C or better

V. Catalog Description
A study of structural biochemistry. Course begins with a review of water, the lipophilic environment, non-covalent bonding, and bioenergetics. Topics include amino acids, peptides, proteins, carbohydrates, and lipids. Enzymes are discussed with emphasis on mechanisms and kinetics. Nucleic acid function is briefly included.

VI. Curricular Relationships
Required for BS Biochemistry degree, BA Chemistry (Allied Health) degree, and for BS Biology (Cellular and Molecular Biology). Chemistry 401, 401L, 402 is one of two optional sequences for the BS Chemistry degree. Many pre-professional students interested in the health sciences take this course.

VII. Student Learning Outcomes
● Students will demonstrate the ability to solve problems, think critically, and draw analogies.
● Students will demonstrate an ability to write effectively and to evaluate the writing of others, particularly with respect to technical subjects.
● Students will demonstrate a solid foundation in structural biochemistry.
● Students will be able to discuss and describe, from a historical perspective, the development of biochemistry as a science.
● Students will be able to critically examine the role of biochemistry in the health sciences.
● Students will be able to demonstrate the ability to read and interpret technical literature.
● Students will be able to work effectively as members of groups.

VIII. Content Outline
● Introduction
• Protein structure and function
• Exploring Proteins
• Enzymes: Basic concepts and kinetics
• Catalytic strategies
• Regulatory strategies: enzymes and hemoglobin
• RNA, DNA, and the flow of genetic information
• Carbohydrates
• Lipids and cell membranes

IX. **Course Procedures/Policies/Grading Scale**

Students are expected to attend all lecture sessions and are required to attend all laboratory sessions. Homework is assigned and graded. Students read biochemistry research articles for in-class discussion. Typically, three hour exams and a comprehensive final exam are given.

Normal grading is used for this course.

Grading Scale: >90 = A; 80-89 = B; 70-79 = C; 60-69 = D; <60 = F

X. **Required/Recommended Readings**

The typical text for the lecture portion of the course is *Biochemistry*, by Berg, Tymoczko, and Stryer.

XI. **Issues Unique to this Course**

CHEM 401L is co-requisite except for students who have successfully completed it in a previous semester.

XII. **Additional Departmental Issues**

none