**BARTON COMMUNITY COLLEGE**

**COURSE SYLLABUS**

# **GENERAL COURSE INFORMATION**

Course Number: CHEM 1821

Course Title: Fundamentals of Biochemistry

Credit Hours: 3

Prerequisites: CHEM 1804/1814

Division/Discipline: Natural Sciences

Course Description**:** This course is a study of the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids with an emphasis on medically related concepts, structures, pathways and mechanisms in biochemistry. This serves as a preparatory course for the MCAT/GRE/DAT examinations.

# **INSTRUCTOR INFORMATION**

# **COLLEGE POLICIES**

## Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

## Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

## The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage.)

## Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at [disabilityservices@bartonccc.edu](mailto:disabilityservices@bartonccc.edu).

# **COURSE AS VIEWED IN THE TOTAL CURRICULUM**

Fundamentals of Biochemistry is a 3-credit hour course at Barton Community College. It is an approved upper-division course which can be used to fulfill degree requirements as a non- laboratory science course in the natural/physical science. In addition, it is recommended to be taken by students enrolled in chemistry/physical science programs at the college, including Biological Sciences, Medical Lab Technician, and certain pre-professional programs (e.g. Pre-Dentistry, Pre-Forestry, Pre-Medical Technology, Pre-Pharmacy, Pre-Wildlife Sciences, Pre-Chiropractic, Pre-Veterinarian etc.) at the college who are planning to take theMCAT, GRE or the DAT.

The transferability of this course varies among 4-year college and university programs. These requirements may change from time to time and without notification. Therefore it shall be the student’s responsibility to obtain relevant information from intended transfer institution during his/her tenure at BCC to ensure that he/she enrolls in the most appropriate set of courses for the transfer program <https://bartonccc.edu/transfer/schools>.

# **ASSESSMENT OF STUDENT LEARNING**

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Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies:

1. Explain the fundamental biochemistry behind veterinary, medical or dental topics and issues.
2. Analyze case studies to critically assess data and the application of biochemistry roles within using context specific discussion of clinical cases.
3. Analyze how living things obtain energy from food, the chemical basis of heredity, what fundamental changes occur in disease, and related issues.
4. Compare and contrast the macromolecules that make up life.
5. Develop and express a general overview of the life of a protein as: synthesis, folding, modification, function, degradation.
6. Explain molecular, structure-function relationships, metabolic and regulatory processes of Carbohydrates, Lipids and Nucleic Acids.
7. Demonstrate the fundamental principle of enzyme mechanisms, enzyme kinetics, biochemical energetics, membranes, nucleic acid and protein metabolism.
8. Compare and contrast enzymes and catalysts.
9. Relate the roles of thermodynamics and kinetics to the rates of chemical reactions.
10. Define and apply the concepts of the Hierarchical Nature of Metabolism including but not limited to metabolic pathway, Krebs cycle, Citric Acid Cycle.

1. Explain nucleic acid biochemistry, including DNA replication and repair, synthesis of RNA (transcription), synthesis of proteins (translation), and regulation of gene expression.
2. Describe and relate the differences between the structures of DNA and RNA.
3. Describe and demonstrate how information transferred and the nucleotide triplets of DNA and RNA molecules that carry genetic information in living cells.
4. Examine the roles of DNA and RNA in replication and repair.
5. Examine the role of RNA in synthesis of DNA.
6. Examine the roles of nucleic acids in synthesis of proteins.
7. Predict the role of gene expression on physical expression.
8. Explain the interdependence of biochemical pathways, pathogenesis and additional new topics.
   1. Describe and relate the differences between chemical and physical changes.
   2. List, name, and relate aspects of metabolic pathways.

# **INSTRUCTOR'S EXPECTATIONS OF STUDENTS IN CLASS**

# **TEXTBOOKS AND OTHER REQUIRED MATERIALS**

# **REFERENCES**

# **METHODS OF INSTRUCTION AND EVALUATION**

# **ATTENDANCE REQUIREMENTS**

# **COURSE OUTLINE**