



Course Number and Title: CHM 265 Biochemistry

Campus Location:
Georgetown, Stanton

Effective Date:
2018-51

Prerequisite:
BIO 262, CHM 151, CHM 240

Co-Requisites:
None

Course Credits and Hours:
4.00 credits
3.00 lecture hours/week
4.00 lab hours/week

Course Description:

In this course, students learn the chemical structures and cellular functions of amino acids, proteins, carbohydrates, lipids, and nucleic acids. Students also use laboratory techniques to separate, characterize, and quantitate biological molecules.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
None

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Examine the role of amino acids in protein structure and function. (CCC 2, 6; PGC 1, 7)
2. Investigate carbohydrate and lipid structure and cellular functions. (CCC 2, 6; PGC 1, 7)
3. Compare synthetic and degradative metabolic pathways. (CCC 2, 6; PGC 1, 7)
4. Differentiate between RNA and DNA structure and function. (CCC 2, 6; PGC 1, 7)
5. Interpret data from defining classical and current experiments. (CCC 2, 5, 6; PGC 1, 7)
6. Use bioinformatics software to analyze enzyme structure and function and biochemical pathways. (CCC 1, 2, 5, 6; PGC 1, 8, 9)
7. Use biochemical techniques for laboratory investigations. (CCC 1, 2, 3, 4, 6; PGC 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Examine the role of amino acids in protein structure and function.
 1. Correlate amino acid structures to physical properties.
 2. Investigate the effect of amino acids and post-translational modifications on the hierarchical structures of proteins.
 3. Compare protein structures and cellular functions.
 4. Evaluate protein separation and characterization techniques.
2. Investigate carbohydrate and lipid structure and cellular functions.
 1. Compare functional groups and structures of carbohydrates and lipids.
 2. Discuss roles of carbohydrates and lipids in cellular processes such as membrane function, energy storage, G-protein pathways, and cell-cell interactions.
3. Compare synthetic and degradative metabolic pathways.
 1. Classify reactions in metabolic pathways.
 2. Compare the bioenergetics of glucose metabolism with other metabolic pathways.
 3. Investigate mechanisms and regulation of metabolic enzymes.
 4. Summarize regulatory mechanisms for controlling pathways.
4. Differentiate between RNA and DNA structure and function.
 1. Examine the structure of the subunits of RNA and DNA.
 2. Summarize the differences between the major structures of DNA and effects of covalent modifications.
 3. Compare the structures and posttranscriptional modifications of the major groups of RNA.
5. Interpret data from defining classical and current experiments.
 1. Distinguish among different biochemical techniques that are used to understand the structure and function of biological molecules.
 2. Identify appropriate experiments to answer biochemical questions.
 3. Predict outcomes based upon a stated hypothesis and experimental design.
6. Use bioinformatics software to analyze enzyme structure and function and biochemical pathways.
 1. Select appropriate software to find information about specific proteins and biochemical pathways.
 2. Compare results after varying parameters in bioinformatics tools.
 3. Develop strategies for interpreting results from bioinformatics software.
7. Use biochemical techniques for laboratory investigations.
 1. Employ biochemical techniques to characterize biological molecules.
 2. Isolate and characterize an enzyme using techniques such as protein purification, electrophoresis, Westerns, and enzymatic assays.
 3. Quantitate purity and activity of an enzyme.
 4. Maintain a laboratory notebook.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Apply knowledge of the theories and principles of chemistry.
2. Follow safety procedures.
3. Perform basic laboratory operations and techniques.
4. Keep a laboratory notebook following standard laboratory practices and present data in an organized written format.
5. Prepare common laboratory solutions.
6. Prepare and purify samples using common techniques.
7. Communicate in a professional manner.
8. Analyze samples by common qualitative and quantitative techniques.
9. Use and maintain common laboratory instruments and equipment.
10. Apply mathematical concepts to the solution of scientific problems.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.