

Minnesota State University Moorhead

CHEM 650: Biophysical Chemistry

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This class will expand and apply chemistry topics (kinetics, thermodynamics, quantum mechanics) to modern biological and biotechnical applications. Biophysical chemistry represents the union of chemistry, physics, and biology and is a natural representation of the cross-cutting approaches and knowledge necessary to understand many current applications of chemistry such as pharmaceuticals and chemical engineering. This course will focus on the practice and applications of thermodynamics, kinetics, spectroscopy, spectrometry, and imaging as they relate to biochemical macromolecules to address current biochemical and biotechnological challenges, including drug design, protein structure/function, and disease.

B. COURSE EFFECTIVE DATES: 02/01/2021 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Thermodynamics, Kinetics, Spectroscopy, Spectrometry, Microscopy/Imaging of biochemical macromolecules

D. LEARNING OUTCOMES (General)

1. Apply the basic quantum mechanical properties of biological macromolecules to explain and interpret biochemical spectroscopy experiments.
2. Define the thermodynamic and kinetic properties of biological systems and explain their mathematical and molecular interpretations.
3. Determine and interpret the output of appropriate experimental techniques to evaluate the physical properties of biological macromolecules.
4. Critically evaluate what current experimental physical techniques can and cannot tell us about biomacromolecules, and understand the origins and nature of these known unknowns.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted