

# Minnesota State University Moorhead

## BCBT 450: Molecular and Biophysical Chemistry

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires both of these prerequisites

CHEM 400 - Biochemistry I

MATH 261 - Calculus I

Corequisites: None

MnTC Goals: None

Biophysical study of molecular structures, biophysical techniques, and biological mechanisms. Includes the biological functions of cells, tissues and organisms in terms of the structure and behavior of biological molecules and techniques.

**B. COURSE EFFECTIVE DATES:** 08/25/2008 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Protein folding, structure and protein data bank, behavior of proteins in protein symmetry and protein interactions, protein-ligand binding, assembly of membranes and energetics of interactions of proteins with membranes, nucleic acid structure and folding thermodynamics. Possible topics for techniques include spectroscopy (fluorescence, UV/vis, NMR, mass spec), microscopy (FRET, confocal, single molecule studies), modeling and simulation of protein and nucleic acid sequence and 3D structure. Selected topics of molecular mechanisms include Energy transduction in membranes

### D. LEARNING OUTCOMES (General)

1. Students will have advanced understanding of the physical nature of biological compounds, be able to quantitatively measure these compounds and to use and apply this knowledge to understand the molecular biophysical mechanism of a cell.

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

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

### G. SPECIAL INFORMATION

None noted