

# Minnesota State University Moorhead

## BCBT 463: Proteomics and Advanced Chromatography

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites:

This course requires both of these prerequisites

CHEM 410 - Biochemistry II

CHEM 405 - Biochemistry Laboratory I

Corequisites: None

MnTC Goals: None

An introduction to proteomics, mass spectrometry, and advanced chromatography systems. Students will learn the theory and development of proteomics as a key component of systems biology and explore how proteomic techniques can be applied to gain insight into a wide variety of biochemical and biotechnological research problems. Advanced techniques include 2D electrophoresis, liquid chromatography, quantitative and tandem mass spectrometry, and protein bioinformatics. This is a lab/lecture course where students will study background and theory and practice some of these techniques in the lab.

**B. COURSE EFFECTIVE DATES:** 09/15/2014 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

### D. LEARNING OUTCOMES (General)

1. Apply proteomic techniques to address research interests in biochemistry and biotechnology.
2. Become proficient with chromatographic and multidimensional electrophoretic separations on complex protein mixtures.
3. Design appropriate protein sample preparation and separation work flows for diverse biological samples based on an understanding of the principles of protein purification, electrophoresis, and chromatography.
4. Determine appropriate mass spectrometry equipment, systems, and requirements for identification of proteins.
5. Recognize bioinformatic tools used in proteomic studies and use these tools for comparative analysis of protein samples.
6. Understand the relationship of proteomics to genomics, metabolomics, and the other "omics" areas of systems biology.

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

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

### G. SPECIAL INFORMATION

None noted