Faculty is required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. BIOT                        COURSE NUMBER:  BIOT 2225

NUMBER OF CREDITS:  4

COURSE TITLE: Analytical and Investigative Lab Techniques

CATALOG DESCRIPTION: This course will introduce the student to quantitative analysis of biological components and products. Students will have to process raw samples, identify which assay is appropriate for the sample, and report assay results. Topics include cell fractionation, chromatography, electrophoretic techniques, fluorescence, spectrophotometry, microscopy among others.

AUDIENCE:

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Area: by meeting the following competencies:
Area: by meeting the following competencies:
Area: by meeting the following competencies:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE: 1 yr chemistry, Intro to Biotech, Biotech Methods II

LENGTH OF COURSE: One semester

THIS COURSE IS USUALLY OFFERED:
Every other year  fall  spring X  summer  undetermined

Four goals are emphasized in course at Minnesota West Community & Technical College:

ACADEMIC CONTENT: The academic objectives of this course are:
   a. To obtain an understanding of biological quantities and how to measure them using various techniques.
   b. To develop assay trouble shooting skills.
   c. To advance the students skill in mathematics as it pertains to biologics.
   d. To acquire advanced experimental design skills.
   e. To become knowledgeable on different chemical and biological instrumentations.
   f. Be able to acquire quantitative data of various biological and chemical processes.

THINKING SKILLS:

Students will need to visualize how equipment is interacting with the various samples to generate data
Students will need to identify what instruments would be appropriate and effective in solving a biological/chemical problem or question
Students will quantitatively analyze biological or chemical samples using equations and equipment or assay generated values
Identifying problems with an assay or sample
Developing assays and titration
Comparing data analysis vs. animal or sample conditions

COMMUNICATIONS SKILLS: This course will help students improve their oral and written communication skills through:
- Note taking
- Preparation of lab reports
- Working with instructor and other classmates to solve different biological or chemical questions

HUMAN DIVERSITY: This course will help students recognize, understand, and appreciate human diversity through:

TOPICS TO BE COVERED:
- experimental error
- sample prep
- quantization of biological or chemical samples using:
  - principles of preparative centrifugation
  - protein purification
  - nucleic acid purification
  - gel filtration chromatography
  - ion exchange chromatography
  - high pressure liquid chromatography
  - isoelectric focusing
  - fluorescent labeling

LIST OF EXPECTED COURSE OUTCOMES:
See topics to be covered.

LEARNING/TEACHING TECHNIQUES used in the course are:
- Collaborative Learning
- Student Presentations
- Creative Projects
- Lecture
- Demonstrations
- Lab
- Problem Solving
- Interactive Lectures
- Individual Coaching
- Films/Videos/Slides
- Other (describe below)

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:
- Reading
- Oral Presentations
- Textbook Problems
- Group Problems
- Other (describe below)
- Lab reports
- Tests
- Worksheets
- Papers
- Term Paper
- Individual Projects
- Collaborative Projects
- Portfolio

EXPECTED STUDENT LEARNING OUTCOMES: Please refer to the list of expected course outcomes.

GRADING POLICIES AND EVALUATION PROCEDURES:
Daily tests, problem sets, quizzes, worksheets and tests will be the basis for grading with points being totaled at the end of the semester. Attendance is utilized in grading. Letter grades will be given for a final grade as follows:

A - 90% and above  B - 80 – 89%  C - 70 – 79%  D - 60 – 69%  F - Below 60%

Veteran Services: Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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