

# Bemidji State University

## **BIOL 1400: Cellular Principles**

### **A. COURSE DESCRIPTION**

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

An introduction to the structure and function of living systems, with an emphasis on basic mechanisms and concepts in biochemistry and in cellular and molecular biology. Intended for biology majors and minors, preprofessional students, and open to any student wishing to fulfill their Liberal Education requirement. Lecture and laboratory. Liberal Education Goal Area 3 (LC)

### **B. COURSE EFFECTIVE DATES: 08/02/2020 - Present**

## **C. OUTLINE OF MAJOR CONTENT AREAS**

1. Introduction - What is life?
2. What is science?
3. Atoms, periodic table, chemical bonds
4. Water
5. Biological molecules
6. Proteins
7. Nucleic acids
8. Lipids and carbohydrates
9. Origins of life
10. Cells, prokaryotic cells
11. Eukaryotic cells
12. Cell membranes
13. Energy
14. Enzymes and metabolism
15. Respiration
16. Photosynthesis
17. Cell division and mitosis
18. Meiosis and sexual reproduction
19. Mendelian genetics
20. Human genetics
21. DNA structure and replication
22. DNA and genes
23. The genetic code, information and content of DNA
24. Transcription and translation
25. Gene expression
26. Gene technology

## **D. LEARNING OUTCOMES (General)**

1. acquire an understanding of the chemistry and biomolecules important for living organisms.
2. understand how information carried by DNA is used by a cell and how alterations within the sequence of DNA can change the characteristics of organisms.
3. become familiar with the relationship between DNA, chromosomal sorting, and inheritance of traits.
4. understand the transformation of light energy into reduced carbon compounds.
5. understand the utilization of energy via respiration.
6. acquire a basic understanding of prokaryotic and eukaryotic cellular organelles.

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

### Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

None noted