HIGHLAND COMMUNITY COLLEGE

Syllabus

BS 101 College Biology
5 Credit Hours (Lecture and Lab)
Prerequisites: None
C&I Revision Date: 11/17/2025

Department:

Biology

Course Description:

This general education course will examine the plant and animal kingdoms, their fundamental principles and processes of life, and their relationship to everyday life. The course consists of three hours of lecture plus three hours of laboratory work per week.

Course Competencies:

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups for this course as approved by the Kansas Board of Regents. **(Kansas Regents Shared Number Course and Title: KRSN Course BIO1010 General Biology and Lab for Non-Majors or KRSN Course BIO1020 Biology I and Lab for Majors.)**

<u>BIO1010</u>

Upon completion of the course, the student should be able to:

1. Demonstrate an understanding of the nature of science
    a. Scientific processes
    b. Scientific methods
2. Demonstrate an understanding of the levels of organization and emergent properties of life
    a. Chemical
    b. Cellular
    c. Organ/organ system
    d. Organismal
    e. Ecological
3. Demonstrate an understanding of bioenergetics
    a. Enzyme activity
    b. Metabolism
    c. Cellular respiration/photosynthesis
4. Demonstrate an understanding of the importance of reproduction in maintaining the continuity of
    a. Mitosis
    b. Meiosis
    c. Differentiation/development
    d. Diversity of reproductive strategies
5. Demonstrate an understanding of applying principles of genetics to unity and diversity of life
    a. Classical genetics
    b. Molecular genetics
6. Demonstrate an understanding of discussing evolution as the mechanism of change in biology
    a. Natural selection
    b. Speciation

    c. Diversity of life/classification
7. Demonstrate an understanding of the principles of ecology
    a. Ecosystem organization
    b. Ecological interactions
    c. Environmental issues
8. Laboratory topics/skills
    a. Microscopy
    b. Quantitative measurement skills incorporating the metric system
    c. Analytical and statistical skills including presenting and/or interpreting graphs and tables
    d. Experience with living organisms in the laboratory and/or field setting
    e. Identification and proper use of laboratory equipment

<u>BIO1020</u>

1. Demonstrate an understanding of the nature of science
    a. Scientific processes
    b. Scientific methods
2. Demonstrate an understanding of the levels of organization and emergent properties of life
    a. Basic biological chemistry
    b. Structure and function of biological molecules
    c. Cellular structure and functions
3. Demonstrate an understanding of bioenergetics
    a. Enzyme activity
    b. Cellular respiration
    c. Photosynthesis
4. Demonstrate an understanding of cellular reproduction
    a. Binary fission
    b. Mitosis
    c. Meiosis
5. Identify the basic principles of Mendelian and molecular genetics, and relate these to the basic principles of Natural Selection and evolution
    a. Classical genetics
    b. Molecular genetics
        i. DNA replication
        ii. Gene expression and regulation
6. Design and perform experiments in a laboratory setting
    a. Microscopy
    b. Quantitative measurement skills incorporating the metric system
    c. Analytical and statistical skills including presenting and/or interpreting graphs and tables
    d. Experience with living organisms in the laboratory

Course Content:

A. Introduction
    1. Definitions
    2. Characteristics of life
    3. The scientific method
B. Cell chemistry, structures, and processes
    1. Chemistry
        a. Structure of an atom
        b. Types of chemical bonds

        c. Acids and bases
        d. Types of carbon compounds
    2. Cell structures
        a. Eukaryotic and prokaryotic cells
        b. Function and cellular structures
    3. Cell processes
C. The transport processes of osmosis and diffusion
D. The processes of cellular respiration and photosynthesis
E. Principles of inheritance
    1. The stages of mitosis
    2. The stages of meiosis
    3. Mendel's theories of dominance, segregation, and independent assortment
    4. Modern genetics and human genetics
    5. The structure of DNA and its relationship to protein synthesis
F. Principles of evolution
    1. Mutation, gene flow, genetic drift, and natural selection and how these processes change populations through time
    2. Definition of the term species
    3. Definitions of taxonomy, classification, and binomial nomenclature
    4. Human evolution
G. Principles of ecology
    1. Ecological terms
    2. Energy use and flow
    3. Nutrient cycles
    4. Biomes and aquatic ecosystems
    5. Population dynamics, human population growth, and human ecology
    6. Domains Eubacteria, Archaea, and Eukarya
        a. Kingdom Eubacteria
        b. Kingdom Archaebacteria
        c. Kingdom Fungi
        d. Kingdom Protista
        e. Kingdom Plantae
        f. Kingdom Animalia

Learning Assessments:

Course competencies will be assessed by the use of lecture tests, subject area tests, lab assignments, quizzes, and Web site activities.

Instructional Materials:

Textbook: Simon, E. J., Dickey, J. L., & Reece, J. B. (2018). *Campbell Essential Biology (*7th ed.). Pearson. ISBN-13: 978-0134765037

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our Disability Services website.

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an online report about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our Equity Grievance Policy.